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must change over to peacetime operation. Mahon engineers are ready with constructive suggestions
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FROM ANODIZED ALUMINUM WITHOUT ATTACK

Enthone Enamel Strippers have no action on anodized aluminum, aluminum alloys, zinc or magnesium.

Their use means fast stripping of enamels without attacking the base metal.

Enthone Enamel Strippers are emulsion type materials used mixed with water and in the temperature range from 160 to 168 F. Urea-formaldehyde, melamine, glyptal, phenolic and other synthetic enamels are removed quickly and cleanly.

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SEE THESE SCORES OF WAR END-USES OF

ZAPON

Finishes

From rifles and machine guns to blood plasma cabinets—Zapon finishes are serving on scores of items used directly and indirectly in our war effort. Old Zapon finishes that are still proving out, new finishes created with the care of a precision machine tool to meet unusual demands—all are doing a job and doing it well, for in many instances Zapon specifications exceed Government requirements. These finishes, serving under such trying conditions of use, transportation, storage and climate, suggest the Zapon coatings that will meet demand when peace returns.

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TWENTIETH YEAR OF PUBLICATION

Industrial FINISHING

W. H. ROHR, Editor E. A. DOSCH, Assoc. Editor

Vol. XX, No. 2 DECEMBER, 1943 $2.00 a Year

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EST. 1917

Letters from Readers

O. K., Mr. Morgenthau

Now that the 3rd War Loan is history, I want you to know that the Treasury Department is deeply appreciative of the generous and patriotic co-operation displayed by the magazines of America in helping to make this, the greatest financial undertaking of all time, a resounding success.

A review of the truly outstanding contribution made by magazines in this $15,000,000,000 drive shows that the various 3rd War Loan advertisements issued by the War Finance Division were sponsored gratuitously by 235 general magazines, 525 business publications, and 65 farm publications.

Here indeed is a record of which not only publishers, but all Americans can well be proud.

To all concerned I take this opportunity of expressing my sincere gratitude.—Henry Morgenthau, Jr.

Drum Spinner-Agitator

On page 34 of the February 1936 issue of your magazine there appeared an article relating to a "Drum Spinner-Agitator," a machine for rotating drums or barrels containing finishing materials to be mixed, agitated or stirred up. We would appreciate advice, if convenient for you, as to the name of the manufacturer of that device.—R. F. Stove Co.

It is a product of The Vol-U-Meter Co., Buffalo, N. Y.—ED.

Typical Trouble; Finisher

We are needing some help of the type that we feel sure you can give us. For the past 40 years, we have always had a good finisher in our shipping room, but for the past year

Wherever you find
Uncle Sam's Air Corps, Signal Corps or Ordnance Depots
you'll probably find

DOLAN'S *"Unquestionable Quality"* FINISHES

We have supplied many thousands of gallons of

★ O. D. LUSTRELESS
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★ REFINISHING PRIMERS
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★ ZINC CHROMATE PRIMERS
★ AIRPLANE DOPES
★ "843" WATER STAINS
★ MARINE FINISHES, ETC.

We invite your inquiries on any Specification Finishes.

V. J. DOLAN & COMPANY, INC.

Manufacturers of "UNQUESTIONABLE QUALITY" *Industrial Finishes*

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THE TARAWA EPIC

AIRPLANES
GUN STOCKS
BOMB SIGHT BOXES
TOOL CHESTS
MARINE PARTITIONS
RADIO INDUSTRY, ETC.
SKIS
INSTRUMENT BOXES

EVERY AMERICAN was deeply moved by the reports and stories of our capture of the Gilberts. The detailed story of the Battle for the Tarawa Atoll was another great epic in the history of the Marine Corps.

We salute the Second Division of Marines who met with great difficulties and stubborn resistance before they were able to say "Tarawa is Ours."

Many hundreds of brave soldiers, sailors and marines gave their lives that we might inch a little nearer to the main objective. It is our job to give them everything they need to complete their job as quickly as possible.

Listed here are a few of the war products now being coated with our materials. Phone, wire or write and let one of our finishing experts help you "keep production rolling."

THERE'S NO TIME TO LOSE—THERE'S JUST TIME TO WIN!

THE LAWRENCE-McFADDEN CO.
Headquarters for Fine Finishes Since 1875
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United's NEW WRINKLE

Made from Non-Critical Oils

The use of critical oils in wrinkle finishes has been prohibited due to a critical shortage.

United's Technical Staff has met this challenge by developing a new wrinkle which is formulated from non-critical oils. It has the characteristics of our standard wrinkle regarding appearance, uniformity, application, and baking schedule, etc. It is available in various colors and shades.

A trial order will convince you of its merits.

United Lacquer Mfg. Corp.

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Lacquers — Synthetics and Special Protective Coatings for All Surfaces

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is obtained by the use of the best quality of

COTTON, WOOL and RAYON FLOCKS

The cost of application by screen process or spray gun is very low—the beauty and utility of articles flock coated are enhanced and their sale stimulated, with increased profits. For the best on the market write to

CLAREMONT WASTE MFG. CO.

CLAREMONT, N. H.

The country's largest manufacturers of Flocks

or two, our finishing problem has been a very serious one for us, due to the fact that we have no trained finisher and no one in our organization that knows anything about this type of work.

We need to have some pretty basic information on refinishing. Our shipments from the factory are coming through badly marred in many instances, and our need for merchandise is so great that we do not dare return the merchandise to the railroad for damage. Our handling problem is increased also due to lack of experienced help.

We would like to have information concerning the proper methods of refinishing as well as retouching. We need to know what are the best materials to have on hand for this work and the proper method of applying each. We would like to know how to refinish our trade-in furniture for resale, and the best method of repairing scratches and mars on lacquered surfaces, varnished surfaces, and the lime-oak type of finish.

It was suggested to us that you would be in a position to give us the type of information we want and you may be sure that any help along the lines we have outlined, will be greatly appreciated by us.—Bradshaw's (Good Furniture Since 1899).

We have furnished some information which we think will help you.—ED.

Can Supply White Cedar

In the November issue, on page 4, we notice that "X. Co." is looking for a finish for artificial fish baits made of white pine, stating that white cedar was formerly used but is now unobtainable. You may inform this company that we can likely furnish them with white cedar dimension blocks for their artificial baits. We have furnished many thousands of these dimension blocks for the artificial bait manufacturers.—MILLER BOAT CO.

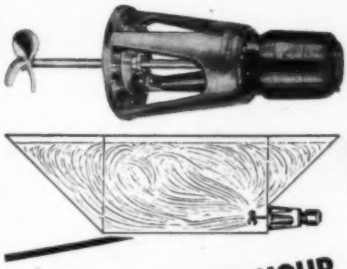
Gold Powder Wanted

We are interested in securing gold powder for our air-brush department. We use this on imitation fabric. Please advise us if you know of anyone who has this on hand and can sell it to us. —S. R. & Co.

Any offers?—ED.

Toy Finishes Wanted

We are opening a new woodworking plant and are interested in securing sources of supply for enamels and lacquers which are available for toy and



MORE PIECES PER HOUR and better finish with "LIGHTNIN" Mixers in your Dipping Tanks

With "*LIGHTNIN*" Mixers in your dipping tanks you can get greater production in your dipping operations and the same uniform coating on every piece whether it's the first or the last, and you don't have to stop production periodically to stir pigments off the bottom and into suspension again. "*LIGHTNIN*" Mixers keep paint mixtures from settling and keep heavy pigments in permanent suspension. "*LIGHTNIN'S*" two way agitating action also thoroughly mixes in thinner to make up for evaporation losses and permits continuous operation of dipping tanks.

Where mixing is a factor in your finishing problems, consult Mixing Equipment Co. engineers. Their twenty-five year experience is yours for the asking.

Fixed or Portable Models

MIXING EQUIPMENT COMPANY, INC.

1027 GARSON AVE., ROCHESTER 9, N.Y.

Cellusuede Flock for Lining Interior and Covering Bottom of Silver Chests

Another example of how Cellusuede Flock can be used to beautify a product, protect its contents and provide a non-scratching base.

Easily applied to wood, metal, glass, paper or cloth. Supplied in one-pound bags, twelve to a case, solid or assorted colors. Also 10 and 50-pound bags. Wide variety of rich colors.

Cellusuede
FLOCK
CP
Cellusuede Products, Inc.
ROCKFORD, ILLINOIS

novelty trade finishing; also flocking materials, etc. Any suggestions you may offer us with respect to the specific makers of this type of materials will be greatly appreciated.—W. P. Co.

Metallic Finish on Hardwood

We are interested in knowing the best process and type of material available for silver, aluminum or light gunmetal finishing on hardwood. The finish must not be one produced from bronzing powders, since their use is restricted for our [casket] industry. The finish should be a quick-drying one which can be shaded and polished. —H. Y. Corp.

We have suggested the products of two or three manufacturers.—ED.

"Ridsmel" Wanted

We are interested in the purchase of a deodorant called "Ridsmel," advertised for use in paints, varnishes, lacquers, etc.—J. G. Co., Toronto, Ontario, Canada.

The material called "Ridsmel" is a product of Holley Chemical Co., 125 E. 25th St., New York, N. Y.—ED.

Conveyors Wanted

We are interested in floor-type conveyors for assembling and finishing departments. Could you give us names of any company manufacturing conveyors similar to Balsa, Inc.?—J. W. K., Quebec, Canada.

Names submitted.—ED.

"Titanine"

Do you know the manufacturer of a product called "Titanine"?—R. R.

We believe this is a product of Titanine, Inc., Union, N. J.—ED.

Antique Oak Finish

We would like to know what kind of material could be used advantageously to obtain Antique Oak finish on solid oak lumber, and we thank you in anticipation for your information.—Casket Co.

We are sending you clippings of articles on this subject from back issues. Also, we suggest that you communicate with finish manufacturers nearest you, for materials.—ED.

FILLERS

★ Filler is *basic.*

★ It *supports* the finish.

★ It contributes to color and tone.

STILLE-YOUNG SPEE-D-DRY FILLER

1 Will not raise the grain.
2 Requires no sanding.
3 Will not shrink or crack.
4 Will not pull out of the pore.
5 Easy to wipe off.
6 Breaks cleanly at the pore.
7 Produces a perfectly-filled surface.
8 Easy to clean up.
9 Enhances the beauty of the wood.
10 Positively will not smudge or streak.
11 Cannot be surpassed for close pore finishing.
12 Saves time and labor.
13 Can be obtained in any colors.
14 Will definitely reduce manufacturing costs.
15 Forms a perfect base for lacquer, varnish or shellac.
16 Will not fade out, bleach, or bleed.

We are the holders of the original patent granted by the U. S. Patent Office for the manufacture of the first fast-drying wood filler—Patent No. 1,885,780.

If you are not now a user—give it your attention.

The Alert Manufacturer is never too busy to consider a better product.

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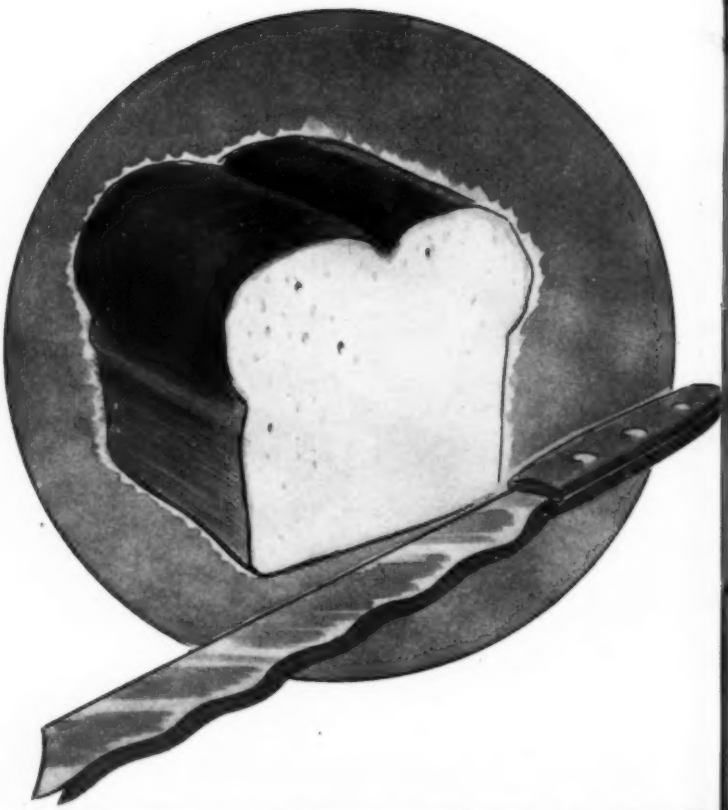


THE LILLY COMPANY
HIGH POINT, N. C.

A Coat BETTER THAN NONE?

IT IS NOT . . . NOT WHEN

Freedom IS AT STAKE!

WE AMERICANS don't do things by halves . . . we're an all-out nation. We've set our minds to this unpleasant job of blasting the daylights out of the Axis and we'll go "all the way", till Hitler and Hirohito have gone the way of Mussolini—or worse. We here at Lilly Varnish Co. likewise do not do things by halves. In war we have gone "all the way" to produce and supply much needed finishes for war products. In peace we go "all the way" to make and produce specific finishes for specific purposes and products, thus backing up our slogan "With the right finish, you'll finish right."

★

LILLY VARNISH COMPANY
INDIANAPOLIS, IND.

HOW INFRA-RED OVENS

Eliminated Bottleneck in Stoker Production

BY JOHN BURCHFIELD
Assistant Superintendent
Iron Fireman Mfg. Co.

The bottleneck on our fully conveyorized production line was the slow drying of paint. We wanted to keep our stokers on the moving conveyor until after they had been packed and crated for shipment. Infra-red adjustable tunnels solved our problem quite satisfactorily.

THE IRON FIREMAN MFG. CO. has installed infra-red baking ovens in its Cleveland plant, and thereby eliminated a very serious bottleneck in production. A uniformly first-class quality of finish is now secured. In order that the reader may understand how this is obtained, it might be well to first explain how the assembly of the stokers takes place in this plant.

Stokers are assembled, spray-painted, moved through the ovens and crated on slat-type continuous conveyors which were built by our maintenance department. We have two complete L-shaped conveyor lines parallel to each other —the conveyor lines being L-shaped to conform to the floor plan of our building. These conveyors operate as four single units. Two are 180-ft. long; at right angles to these are two others 150-ft. long. Each conveyor unit is 26-in. wide and 26½-in. high; and each one is driven by a 1½-hp. motor through a speed reducer and sprocket so that speeds up to 12-ft. per minute can be obtained.

Cross-Slat Conveyors Extend Through Water-Wash Booths

We have two water-wash spray booths, and a conveyor unit extends right through each one of them. At right angles to the assembly conveyors, which extend through spray booths, are two other conveyor units each of which passes through an infra-red baking tunnel, as shown in illustrations accompanying this article. The addition of a few accessories and a complete crating of stokers takes place on the conveyor units that pass through the infra-red tunnels.

At the beginning of the assembly conveyor line, stoker parts are attached to the base or skid of the crate. This affords a means of moving the stoker along on the conveyor line, while it is being assembled. The parts for the assembly are located at central points along both the assemblies on conveyor line, so they tie in with the points of actual assembly. When the stoker reaches a point

Water-wash spray booth through which the conveyor passes, loaded with stokers and stoker parts to be painted. Quick drying occurs later in infra-red tunnels.

approximately 10-ft. in front of the paint booths it is completely assembled. At this point a rigid inspection takes place, as the motor has been installed and the stoker may be tested out completely, as many minor defects, such as loose nuts and bolts, and the defects in metal, can be easily discovered before the stoker is painted. The stoker then is completely washed clean of all grease and other substances. Then it enters the paint booth where it is sprayed by workmen operating in the water-wash spray booth, spraying both sides of the stoker.

We find that we may leave the stoker on the slat-type conveyor while it is being painted, as the air suction in the paint booth carries away enough of the overspray so that it does not build up on the slats of the conveyor sufficiently to cause any seriously difficulty. The stoker then leaves the

paint booth, as the conveyor unit extends to a point 15-ft. beyond the spray booth. At this point there is a turntable on which the stoker may be turned and placed on the crating conveyor which is at right angles with the assembly conveyor. The same applies to both parallel conveyor units, so there are really two turntables, one for each conveyor line.

The stoker has now been assembled and painted, and is on the actual skids in which it will be crated. We might add at this point, that the reason for the skids being attached to the stoker from the very beginning, is that we find it much easier to handle the stoker by doing this.

Through Infra-Red Ovens

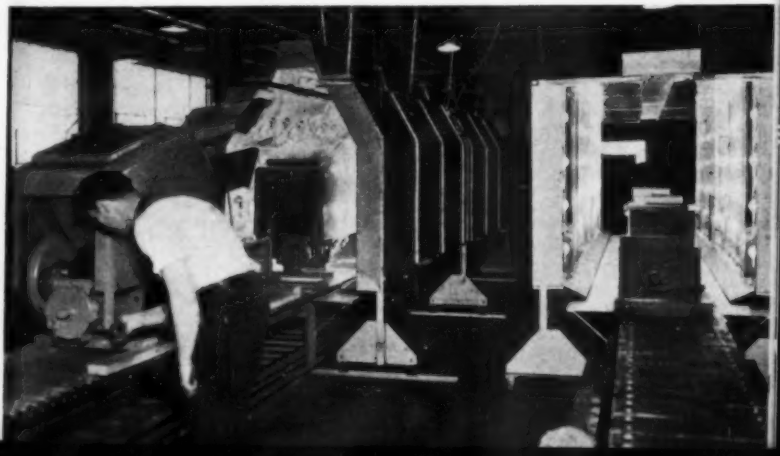
Each of the parallel crating conveyors is 150-ft. long, with the infra-red drying ovens located 15-ft. from the starting end of these conveyors, where they meet the assembly conveyors. The stoker then enters the infra-red ovens for the drying process. This conveyor runs continuously. The speed of the conveyor and the length of the ovens is such that this plan works satisfactorily.

After the stokers clear the drying ovens and have returned to room temperature, a few minor accessories are added, such as the trademark decal, and other loose parts that are necessary. A large paper bag is then placed over the complete stoker and a prefabricated crate, which is the top only, is placed over the stoker and nailed to the skids which were placed under the stoker at the beginning of the assembly. By the time these operations are completed, the stoker has arrived at the end of the crating lane, and here, for the first time since the assembly of the stoker started, it is placed on the floor completely crated and ready for shipment.

Where Our Bottleneck Was

Some time ago, we were seriously hampered in our production along the crating line due to the fact that with the old method of air drying, nothing could be done toward the completion of crating,

A view of our parallel conveyor lines and adjustable infra-red drying tunnels.



etc., because the paint on the stoker was not completely dry. This cost us serious shut-downs and completely clogged up the entire assembly department. We decided to install an infra-red oven on one of the conveyor lines, in order to eliminate this bottleneck. Needless to say, after the first oven was in operation a short time, a second one was installed on the other line.

Details of Infra-Red Drying Ovens or Tunnels

The first oven was constructed of 16-gage steel on angle-iron frame work, and placed over the conveyor line. The top of the oven is divided, and the bottom is set on rollers in channel iron. The reason for this is that the oven can be rolled back, therefore making it wider in order to accommodate the various sizes of stokers. Flexible conduit is used to connect the oven to permit the movement of the opening and closing operation. The size of the oven is 36½-kw., using 250-watt, 115-volt, infra-red drying lamps. These are connected, two in a series, to a 3-phase, 230-volt circuit, with load balance. The drying lamps are nested in gold reflectors; the lamp recesses are fitted into sheets of 20-gage Alzak aluminum. The basic principles of controlled convection and re-direction of "spilled" energy are also incorporated by means of a hood of aluminum at the top, and baffle plates fitted tightly to either side of the conveyor base.

When the second oven was installed, the gold reflectors were not used, but the 250-watt drying lamps, which have reflectors as an integral part of the lamps, were used instead. However, these are nested in Alzak aluminum reflectors and baffles are used throughout for the re-direction of the "spilled" energy.

Reflectors were also installed in the hood of this oven, as the stokers on this conveyor line are considerably heavier and require more energy for the drying process. This oven is also built with the divided top and rollers set in channel iron so that it can quite easily take various sizes of stokers. The size of this second oven is 40-kw., with electric connections being the same as on the first oven that was installed.

With the normal rate of conveyor speed it requires less than 9 minutes for a stoker to pass through the infra-red ovens. A few minutes more are required for it to cool. By the time it has reached the packing and shipping section—a matter of 25 minutes—the cooled enamel has a tough, hard lustrous finish. In fact, it is felt that the conveyor could be shortened by some 20-ft. and still give good results.

It has been found by experience that with the new infra-red ovens, it is easily possible to bake the finish on 100 stokers in an 8-hour day, an average of better than 12 stokers per hour. As the operating cost of the oven averages about 36 cents per hour, it is apparent that infra-red baking costs less than 3 cents per stoker.

Please, You Help Too

Because of the epidemics of infantile paralysis during 1943, which necessitated the expenditure of unusually large sums of money, we are anxious to have every possible medium in the United States co-operate during our 1944 Fund-Raising Appeal, which will take place from January 14th to 31st inclusive. . . . The National Foundation for Infantile Paralysis.

OFFICIAL U. S. NAVY PHOTOGRAPH

MURPHY PROTECTIVE COATINGS

Going on more and more war materials all the time

Best proof of the dependability of our protective coatings, as well as the caliber of our wartime service, is the impressive and ever-growing variety of war products being finished with Murphy Protective Coatings. Shows, too, that you can get from Murphy a finish exactly suited to the needs of your product.

Murphy salesmen are truly *service men.* Manufacturers find their wide wartime experience helpful, not only in solving finishing problems, but also on priorities.

In wartime as in peace,
PUT IT UP TO MURPHY

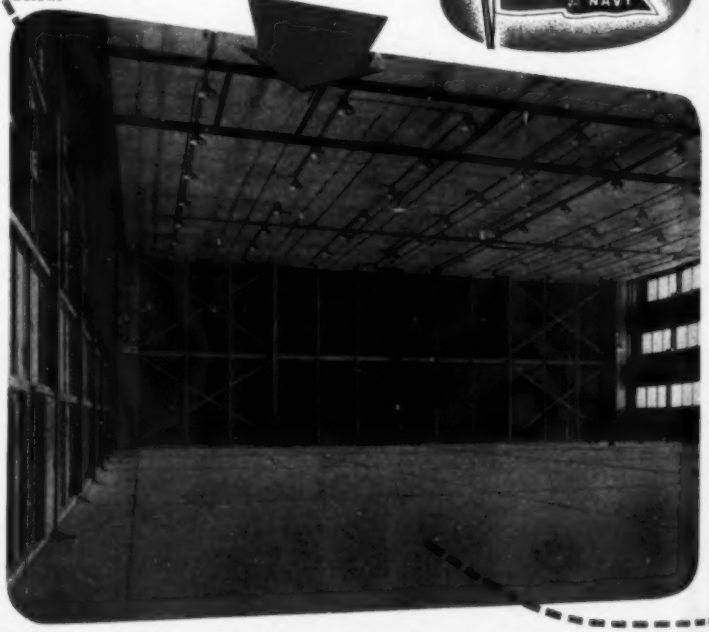
MURPHY VARNISH COMPANY
NEWARK SAN FRANCISCO CHICAGO

- Airplanes
- Gliders
- Communication Sets
- Commando Ramps
- Optical Apparatus
- Plywood
- Searchlights
- Liberty Ships
- Shells
- Cargo Trucks
- Propellers
- First Aid Boxes
- Gunstocks
- Gun-fire Controls
- Army Locomotives
- Ration Cans

KEEPING UP WITH THE *Douglases*

ANOTHER GIANT SPRAY BOOTH TO SPEED VICTORY

When engineers at the Douglas Aircraft Company, Inc., wanted a waterwash spray room large enough to house a completely assembled Douglas Army Transport Plane, Binks engineers designed and built the huge installation shown below.



NEW YORK - DETROIT SAN FRANCISCO - PHILADELPHIA - PITTSBURGH - CLEVELAND - ST. LO

The men in the background of the photograph reproduced to the left give some idea of the size of a recent Binks installation at a Douglas Aircraft Company plant "somewhere in America." The doors shown on the sides of the room slide up to let great 4-motor Douglas Army Transport planes roll into the booth for painting.

This huge Dynaprecipitor Water Wash Spray Booth has a water curtain totaling 40 feet high and 100 feet long. Air from the room is drawn through this curtain. In this way paint fumes and atomized finishes are washed from the air before it is vented.

The chief satisfaction of designing and building spray painting equipment on this large scale is the knowledge that the work helps to speed the day of victory. Next to that is the valuable experience gained by Binks engineers and designers . . . experience that will make Binks postwar equipment and design services better than ever . . . not only on large installations but right down to the smallest accessory.

BINKS MANUFACTURING COMPANY

3114-40 CARROLL AVENUE, CHICAGO 12, ILLINOIS

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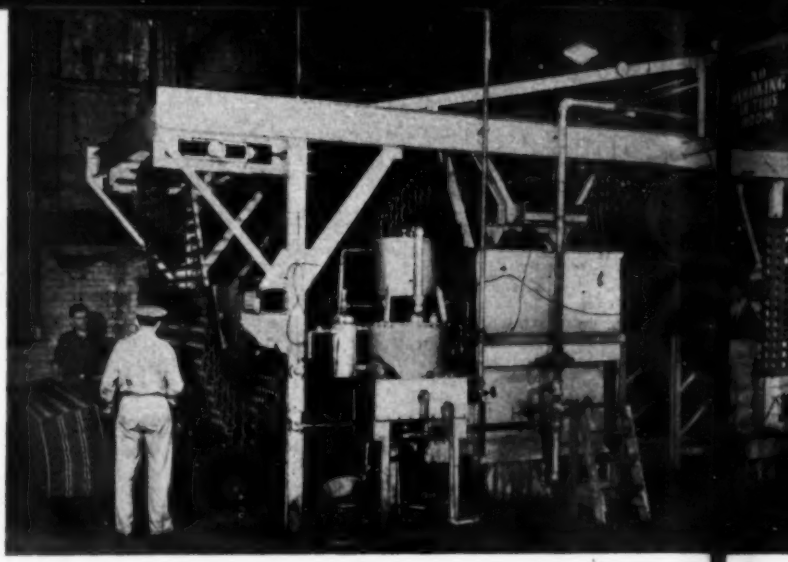

High Speed Finishing of Ai

HIGHLY important to U. S. invasion efforts in various parts of the world are the new portable airplane landing mats which are rapidly assembled at the scene of military operations. These mats are manufactured from 10-gage steel sheets in sections 19-in. wide and 10-ft. long, properly punched and slotted so that untrained workers without special tools can easily link them together to form a smooth, continuous runway.

Because a runway 3,000-ft. long and 150-ft. wide can be laid in a day, the demand for these mats has necessitated extremely high production. Because the mats are constantly exposed to every kind of weather, it is necessary to cover them with a protective and durable finish. For reasons of camouflage, this finish is specified as a standard olive green color of the army, which, combined with the open design of the mat sections, gives the mats the appearance of the terrain on which they are used.

Foremost among manufacturers of aircraft landing mats is the Empire Plow Co. of Cleveland, Ohio. Through proper design of the large progressive dies which stamp out and form the sections, this firm has achieved an unprecedented production rate, turning out 4,250 sections (180 tons of steel) every 10-hour shift.

This production rate threatened a serious bottleneck in the finishing department until the system described in this article was installed by an industrial oven engineering firm. This continuous finishing system degreases, dips,

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High speed conveyorized set-up cleans sections of aircraft landing mats, paints them by immersion in dip tank, allows excess paint to drain off, and bakes the olive green coating in oven supplied with heated air, automatically controlled.

At left, across opposite page, you see the loading end of cross-bar chain conveyor to which sections of landing mats are hung in position to travel through the degreaser, drying zone, dipping tank, drain area, oven and cooling zone.

...Aircraft Landing Mats

BY C. A. LITZLER

Chief Engineer for the Industrial Oven Engineering Co.

drys, bakes and cools the landing mats as fast as the forming presses can turn them out, and can, in fact, be stepped up to higher speed if necessary.

Features of Finishing System

Next to the speed of operation, which was the primary requisite in this case, the most outstanding thing about the finishing system is its economy, which may be indicated under three headings:

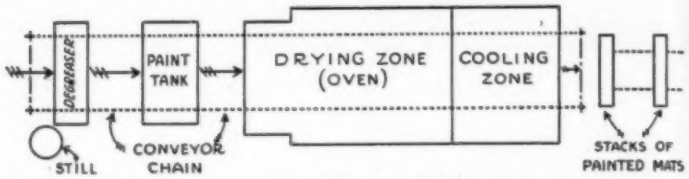
1) Heating—Heavily insulated oven shell, maximum re-circulating of oven atmosphere, and use of pre-heated air from cooling zone as make-up air for heating system result in 12% fuel saving, by actual test.

2) Labor—Automatic operation, including use of mechanical loaders and unloaders, enables four men to handle the production of the system. In other cases, 18 men have been needed to carry on the same operation.

3) Scrap Rejection—Rejects run less than ¼ of 1 % of total production, a tiny fraction of reject percentage in manual operation.

Following is a more detailed description of the finishing system's function:

The conveyor is loaded by two men, as shown in one of the accompanying illustrations. The loading



Plan view of the series of units included in conveyorized set-up for cleaning, dip coating and oven-drying painted sections of steel landing mats for aircraft.

rate is dependent upon production. The system was originally set up to handle one mat section, from start to finish, every seven seconds. Should the production rate be decreased, it is only necessary to alter the speed of the conveyor by adjusting a variable-speed drive unit, which is visible in the upper left hand corner of the picture, which shows the unloading end of the conveyor.

Cleaning, Dip Coating, Draining, Preheating, Baking

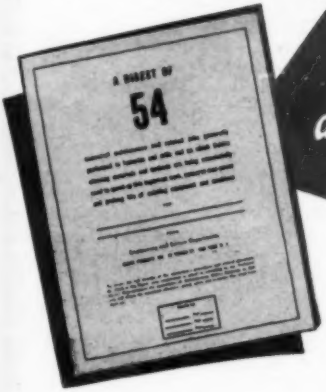
After being hung on the conveyor, the landing mats pass through a solvent degreaser which removes all film and grease, preparing the section for automatic paint dipping. The maximum capacity of the conveyor is accommodated by the degreasing equipment.

Specially constructed agitating blades, mounted on a through shaft at the bottom of the V-type paint dip tank, provide the necessary turbulence to assure a homogeneous solution. A 2-hp. motor, in conjunction with a planetary gear reducer, drives the agitating mechanism. Careful control of the paint conditions assures that the mats will emerge from the dip tank evenly covered, with minimum carry-over to the drain board.

(To page 24)

At the unloading end, mats are removed from conveyor, stacked on dollies and then moved forward to workers who wire the bundles and make them ready for shipment overseas.

You Can EXPEDITE Your Maintenance Cleaning Work



With the short cuts described in this NEW OAKITE DIGEST

Because war conditions are so rapidly multiplying maintenance problems in metal-finishing and other plants, you will find this NEW Oakite DIGEST of invaluable help. It gives you practical, time-saving short cuts on 54 different, essential maintenance jobs.

Based on the successful experience of more than a thousand concerns, it outlines how Oakite cleaning materials and de-scaling compounds are (1) speeding up plant maintenance, (2) conserving man-hours, (3) shortening equipment down-time, (4) facilitating repair and overhaul work, and (5) eliminating fire hazards.

TELLS HOW TO:

Clean Paint Spray Booths, Equipment
De-Scale Metal Washing Machines
Clean Air Conditioning Equipment
Recondition Gas Welding Tips
Clean Die Casting Machines
and handle 49 other essential jobs!

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Your copy of this helpful, fact-filled guide to better plant maintenance is FREE! Write for it today!

OAKITE PRODUCTS, INC., 32F Thames St., NEW YORK 6, N. Y.

Technical Service Representatives Located in All Principal Cities of the U. S. and Canada

OAKITE MATERIALS · METHODS · SERVICE

CLEANING FOR EVERY CLEANING REQUIREMENT

After passing from the dip tank, the freshly dipped mats pass over the drain board to enter the exhaust zone of the oven, where a large-volume exhaust fan performs three major functions. The primary job of the fan is to exhaust approximately 25% of the oven atmosphere to maintain safe operating conditions within the oven zone. Second, as the hot air is pulled from the main oven zone into the exhaust zone, it passes over the freshly dipped mats and flashes the volatiles from the surface before the mats reach the baking zone of the oven. Third, the fan creates an efficient air seal at the open entrance end of the oven by drawing air from both the oven and the room.

After four minutes of such preheating, the mats pass into the high-temperature zone of the oven, where the finish is thoroughly baked. The principal factors involved in producing the excellent finishes which are characteristic of this system are: 1) efficient air distribution over the work; 2) temperature uniformity in the baking zone; 3) correct exhaust conditions to maintain proper oven atmosphere; and 4) a low overall temperature gradient between the supply and recirculation temperatures.

Oven Heating Plus Complete Automatic Controls

Heated air for the system is furnished by a self-contained 3,000,000-B.T.U. direct gas-fired heating unit, mounted on its own structural platform alongside the oven. Circulation is effected by a double-width, double-inlet centrifugal fan placed within the insulated heater casing.

Electronic safety controls, part of the air heater equipment, protect the system against any kind of flame, fuel, power or mechanical failure. The fuel input is regulated according to the demand of the main temperature recording controller, the actuating bulb of which is located in the oven zone. Protective controls prevent the

View of part of the side and the outfeeding end of the conveyorized set-up for cleaning and painting sections of aircraft landing mats. The overhead drying oven is shown more clearly in this view. At upper left you see the heater and fan for supplying heated air to quickly dry the paint on the product.

• If you need a specific finish for a tough job, we can probably help you. We have produced a great many finishes to meet or exceed exacting government specifications. One of them may meet *your* needs. Or we will try to develop a finish for you.

Here, for example, are a few of the many Johnson's Finishes now helping speed production for many manufacturers of war implements.

Johnson's Wax-O-Namel for Navy shell boxes, life rafts, powder storage tanks, ship furniture.

Johnson's Olive Drab Lustreless Enamel for heavy-duty air force jacks and airplane motor repair docks.

Johnson's Enamels and Primers for tanks, bicycles, gas mask parts, air conditioning units.

Johnson's Maritime Paints and Enamels for ships of all kinds.

Johnson's Paints are formulated for spray, dip and roller coater systems. Tough, hard-drying, mar-resistant finishes, they will help you maintain your production schedules. Write us today.

Back the attack—buy more War Bonds

S. C. JOHNSON & SON, INC.
PRODUCT FINISHES DIVISION
Department IF-123
Racine, Wis.

system from exceeding safe operating temperatures, and also prevent temperature build-up anywhere in the system.

Through Cooling Zone; Unloading; Packing

The mats are carried directly from the baking zone to the cooling zone, where room air is inspirated through grille-type openings by means of a large-volume, centrifugal-type cooling fan. Heat, which is drawn from the mats during the cooling process, is used to preheat the primary and secondary combustion air of the heating system. Excess air can be diverted to the room for space heating. Substantial savings are made and the overall efficiency of the system is increased by utilization of this heat, which otherwise would be wasted.

When the mats leave the cooling zone they are cool enough to be handled, and are unloaded at the floor level, as shown in one of the illustrations. Two men handle the unloading, placing the mats on special dollies which roll on an inclined track. The dollies are equipped with locating pins which align the mats for wiring and strapping. After the various bundling, wiring and strapping operations are completed, the mats roll down a gravity conveyor to a point where a crane loads them into railroad cars for shipment.

Economical Features; Future Change-over

It should be noted that the entire oven, which comprises the greater part of the length of the system, is overhead, providing floor space below which is used for machinery operation and material storage. In finishing plants today, when wartime expansion has limited space and increased its value, overhead operations can be very important.

Although the system described here was designed specifically for the finishing of airplane landing mats, there is nothing about it which limits its use to these particular items. The Empire Plow Co. is already planning to swing the system over to finishing farm machinery parts, and when the time comes to do it, this change-over can be effected in a few hours —i.e., the time required to clean the dip tank and change its paint, and perhaps to put a different set of hooks on the conveyor.

Binks Mfg. Co.'s Plant No. 2, at 3255 W. Lake St., Chicago, Ill., where the entire 18,000-sq.ft. is devoted to the assembly, processing, export boxing and shipping of paint spray outfits on U. S. Engineers' contracts.

WRINKLE
A PROVEN
WARTIME FINISH
GLARE PROOF—
Wrinkle being a relatively dull finish does not give away position to the enemy.
HEAT, COLD AND MOISTURE RESISTANT—The Elements do not affect substantially the toughness of Wrinkle.
SURFACE PROTECTION—
Being a hard finish, Wrinkle protects any surface from scuffing and hard use effects.
ONE COAT DOES THE JOB—
Wrinkle being a one-coat-finish, eliminates costly finishing operations.
BILLY WRINKLE SAYS
"What Wrinkle will do for your product is best explained in 'New Wrinkles in Finishing'. Write for your copy today"
NEW WRINKLE INC
314 W. FIRST ST. DAYTON 2, OHIO

Finishes & Conditions Today & Tomorrow

RAYMOND C. ADAMS
Chief Chemist and Superintendent
The Southern Paint Products Co.

MR. Purchasing Agent, how many times have you made this remark: "I have been using this finishing material for years and it has always given complete satisfaction—and until such a time as it no longer does the job, I am not interested in changing." Well, if you have made that remark and if, during the present war, you have been using any civilian finishes you can no longer truthfully make that statement.

Civilian finishes that are now available to industrial manufacturers are of greatly inferior quality to those furnished before. There's no need to tell you why. You know as well as I that the greater portion of the raw materials used to make our former high quality industrial finishes have gone to war.

Wartime Conditions Impose Severe Limitations on Quality

The often used phrase, "Necessity is the mother of invention," is not very applicable to the paint industry with regard to supplying civilian finishes. During normal times, of course, the phrase has been very applicable. Who can question that during normal times, when given all the tools with which to work, the paint industry has always kept abreast of other developments by supplying suitable finishes for them. However, during the present crisis, to ask the paint technologist to scratch his head, throw a few test tubes around, and come up with a new and improved finish, available in unlimited quantities, and at a nominal price (or for that matter any price) for use on civilian articles, is about as logical as asking for a substitute for gasoline with which to supply civilians.

In one respect, it is unfortunate that this situation has arisen. It has completely reversed one of the fundamental channels through which industrial finishes were formerly manufactured and sold, namely, that of performance first. Let me explain: Finishing is usually the last step in the manufacture of an article. Usually the finish is applied for a decorative effect while, at the same time, giving protection. I think most superintendents and executives will admit that regardless of how mechanized and modernized their plant is, if trouble does appear, it is usually in the finishing room.

Lacquer blushes, the baking enamel doesn't dry, or maybe it wrinkles; the stain is off color, the sealer won't sand, etc. Although great strides have been accomplished in this respect, there is still an almost unlimited number of uncontrollable factors that enter into obtaining the desired

Reliable NON-CRITICAL FINISHES

WITH LACQUER SPEED

RE-LI-LAC

SEALER

SPRAYS SMOOTHLY
DRIES QUICKLY
SANDS EASILY
CAN BE GLAZED
GOOD HOLD OUT
GOOD CLARITY
TOUGH—DURABLE
ECONOMICAL

TUF-TEX

FINISH

VARNISH BODY
HANDLES IN AN HOUR
RUBS OVERNIGHT
POLISHES OR DULL RUBS
CLEAR—TRANSPARENT
FULL GLOSS OR SATEEN
NON SHRINKING
HARD—TOUGH—DURABLE

[illegible] schedule with an order for 5 gallons or a drum. If you are not pleased, return unused portion and get your money back.

"RELY ON RELIANCE"

RELIANCE VARNISH COMPANY, INC., LOUISVILLE, KY.,-CHICAGO,

finish. Such factors as humidity, temperature, and the human element must always be taken into consideration. As a result of this fact, users of industrial finishes have generally purchased the finish that gave them the least trouble and the most satisfactory job.

Alert Salesmen Eager to Offer Services and Products

At the same time, paint salesmen are (or possibly I should say were) so thick around plants that the buyers, superintendents and finishing foremen accomplish little else than interview them. These salesmen are constantly on the alert to learn of any trouble that is being encountered because this gives them a chance to push the merits of their own products. Although, in many cases they don't have the slightest idea whether or not their products will work any better, they feel that if given the opportunity of a test they are just that much nearer selling the account.

Paint Technologist is Placed on the Spot

If the trouble is severe enough, the manufacturer welcomes outside help and gives his consent for a test. The salesman then dashes out of the office to the nearest telephone, calls the technical director of his company, explains the trouble and assures him that if he can develop a product that will work (the salesman assumes that this particular problem has never arisen before and, of course, he doesn't expect to have a standard item that will do the job) and will meet him at the plant tomorrow morning at 8:00 A.M. (maybe it's only 200 to 300 miles away) with the sample that he knows he can get the business.

The technologist is dumfounded (and don't think I don't know). He is expected to thumb through a book and come out with the answer. He has no sound conception of the conditions, for 99% of the time the salesman's deductions or hunches are wrong (don't misunderstand. I am not criticizing the salesman. Selling is his job, not research.) At any rate, the technologist attempts to duplicate the manufacturer's conditions in his laboratory while conducting exhaustive tests well up into the night. He usually comes out with something he thinks might work, prepares his sample, drives the rest of the night, meets Mr. Salesman, conducts the test, and in about 99% of the cases it fails.

By this time, the technologist has a good conception of the conditions and possibly he can, in about a week's time of continuous work in his laboratory, come up with the answer. Sometimes it takes several weeks, even months. In the meantime, however, several competitors have also tried out their samples and eventually either the detrimental conditions adjust themselves, or some one does solve the problem.

Competitive Spirit Formerly Helped; Present Difficulties

At any rate, the point I wish to emphasize is that in this particular case, several companies and their technical staffs have spent hours of valuable time. Of course, even the companies who weren't successful do not begrudge their time because after all it might have been they who were successful and, of course, the business derived would have more than offset their initial work.

Such a competitive spirit as this among suppliers of industrial fin-

A Word
TO THOSE WHO PICKLE

CHEMICALS ACP PROCESSES

ACP Pickle Bath Toner is being utilized to improve the action of acid pickling and stripping baths in those cases where the use of Rodine is not indicated.

Pickle Bath Toner, supplied either as a liquid or powder, has little inhibiting effect and should, therefore, not be confused with the strong inhibitor, Rodine.

It, however, improves the effect of an uninhibited pickling or stripping bath. Among the improvements are:

Brighter and smoother surfaces
Reduction in drag-out
Better wetting of the metal
The removal of light films of oil
The formation of a thin, fume retaining blanket

ACP Pickle Bath Toner can be used alone in acid baths or with Rodine, the action and effectiveness of which is thereby enhanced.

Manufacturers of Inhibitors & Metal Working Chemicals

AMERICAN CHEMICAL PAINT CO.
AMBLER ACP **PENNA.**

Note: West Coast Plants may address inquiries and orders for prompt delivery to: Leon Finch, Ltd., 728 East 59th St., Los Angeles, Calif.

American Chemical Paint Co., Ambler, Pa.

Please send me general Technical Service Data Sheets on

☐ Pickle Bath Toner ☐ Rodine

Name.....*Title*.....

Company.....

Address.....

B-12

ishing materials has, in the past, been the medium through which outstanding finishes have given birth. Under present circumstances however, it is practically impossible for technologists to render this valuable service. Not only is the greater portion of our paint manufacturers' time being spent on developing and manufacturing war finishes, but other obvious factors must also receive consideration.

Most laboratories do not have sufficient personnel. Even in those laboratories where there are sufficient technicians, their time and energies are spent trying to find materials with which to make present finishes. The problem now, with regard to civilian finishes, is supplies. Naturally, quality has been greatly reduced.

Users of industrial finishes have become accustomed to the deficiencies of their finishes and act accordingly. However, under no circumstances should we as suppliers, and you as users of finishing materials, lose sight of the fact that when this war is over *quality must be first*. Then such factors as supplies, prices, etc., must become secondary. We technicians must once again develop that desirable competitive spirit, with regard to quality, of always trying to produce something better. Also, you as users of industrial finishes must regain the critical analysis of your finish, always demanding better quality and performance.

Multiple Drum Agitator

MIXING paint materials in drums is a one-drum proposition in all but the largest finishing departments. However, where it is desired to agitate the contents of more than one drum at a time, a means of doing so is available. A firm that has long specialized in various types of mixing machines, has developed one that includes four sets of rolls, so that as many as four different drums of material can be rotated on the machine at the same time. The machine is motor driven but can be hand cranked to stop at a point where the bung is in emptying position.—E. H.

Color and Heat

COLORS absorbe and reflect heat rays as well as light rays. For this reason they are practical and efficient "insulators" to control temperature and minimize the evaporation of certain liquids.

According to data assembled by the Color Research Laboratory of the Eagle Printing Ink Co., Division of General Printing Ink Corp., New York, white is the best color to repel heat, and black the poorest. The hold of a white ship in the tropics will be at least 10° cooler than the hold of a black ship. Why, therefore, shouldn't baby carriages, water tanks, summer shacks, automobile tops, and countless other products and gadgets, take advantage of this magic?

In a study of gasoline storage tanks, the U. S. Bureau of Mines found that a red tank had an evaporation loss of 3.54% (over 4½ months) as against 1.4% for white. Home radiators in white and light colors also were found to be about 17% more efficient than those painted black or bronze.

Light colors on factory walls, on gasoline and benzine cans, on surfaces exposed to high temperatures seem logical indeed, and perhaps wise in economy and the reduction of certain hazards.—H. KAUFMAN.

LOOK WHAT'S HAPPENING TO FINISH BAKING!

Here's a preview which gives a hint of the sensational performance you'll get tomorrow—with the revolutionary *new* finish-baking unit developed by Despatch.

Contrasted with present methods of finish-baking, this new system gives outstanding advantages:

CUTS BAKING TIME through a new Despatch-engineered system of heat application . . .

IMPROVES QUALITY of paints, varnishes, lacquers and enamels in nearly all cases . . .

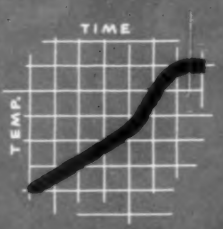
REDUCES COSTS in baking through more efficient use of heat and elimination of rejects . .

SAVES LABOR through automatic operation, use of electronic controls. Assures uniformity.

WATCH FOR ANNOUNCEMENT giving full details and explaining accompanying graphs.

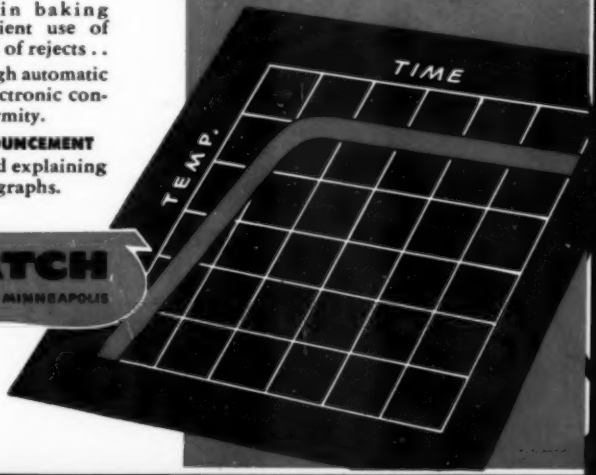
DESPATCH OVEN COMPANY MINNEAPOLIS

FIRST THIS . . .



THEN THIS . . .

NOW THIS *NEW* SYSTEM



DEVILBISS GUNS HELP KEEP

Ship Shape

Speeding camouflage on air fighter ships and a seafaring finish on radio sets for Liberty ships

● To the men who pilot our ships of both the sea and air lanes, camouflage and communications are important factors of safety . . . factors that DeVilbiss Spray Guns help supply *faster.*

In the upper illustration you see DeVilbiss Gunners spraying camouflage paint on the fairings and cowlings of planes at a Curtiss-Wright plant. Below, another applies rugged seagoing paint protection to small parts of marine radio units produced by Federal Telephone and Radio Corporation. And they do it at speeds that Victory demands.

Check into your coating and finishing operations, today. Then, see what you gain by using the spray process as it has been developed by its pioneers—DeVilbiss. It will not only help you on war output, but it will simplify conversion to profitable peacetime operations.

THE DEVILBISS COMPANY • TOLEDO 1, OHIO
Canadian Plant: WINDSOR, ONTARIO

PROUD to have won the coveted Army-Navy "E" for excellence in war production, the men and women of DeVilbiss pledge to continue giving their all-out best—for Victory.

DEVILBISS
SPRAY SYSTEMS

SPRAY EQUIPMENT • EXHAUST SYSTEMS • AIR COMPRESSORS • HOSE AND CONNECTIONS

Only Extra Performance wins!

FINISHING FACTS

There are factors to strive for and things to guard against in the elimination of rejects, a few of which are listed below.

1. Settling
2. Skinning
3. Color
4. Lifting
5. Drying time
6. Texture
7. Chalking
8. Baking time
9. Baking temperature
10. Resistance to various chemicals
11. Flexibility
12. Viscosity or mobility
13. Color composition
14. Hardness or toughness
15. Blackness of black finishes

If you have a finishing problem why not consult our research laboratory technicians? They have the experience, modern equipment and facilities that may save you manpower hours and reduce production costs.

- New, Comple
- up to the mi
- Catalogue of
- U. S. Governm
- Specification

Send for you

Under the stresses and urgencies of war, our plant is maintaining a record-breaking pace in the production of fine industrial finishes, for practically every industry, meeting specifications, exceeding specifications . . . and producing them on time.

ALAKA

Extra Performance

LACQUER & CHEMICAL CORPORATION

214-220 FORTIETH STREET · BROOKLYN 32, N. Y.

The Editor of INDUSTRIAL FINISHING *may never let you read this gripe, on my part, but he is handicapped a little now due to losing some men who can write, and who are now in the armed forces. If he publishes what I have written, I know he will polish up the rough or harsh spots.—*

Adam W. Tritsch

Answering Some of Your Complaints on Finishing

BY A. W. TRITSCH

PRODUCTION lines on most all war contracts end with one or more applications of a coating of paint or lacquer. These production lines are scheduled so that no bottleneck should occur, but many times some operation, not being done correctly, causes trouble somewhere on the line.

This usually shows up where the paint or lacquer coatings are applied, with the result that rejects increase. The trouble must be located and corrections must be made, all of which means a tie-up of items that will not pass inspection. The chief cause of these troubles seems to be the human element, and it can be traced to lack of proper training on how to do each job correctly.

Large Labor Turnover; More Training Needed

With a large labor turnover, new employees are constantly being added to the personnel, and these workers are not given the proper training. It goes back to the foreman, who leaves them to learn as best they can from their fellow employees; or possibly he talks to them and tells them what to do, but doesn't show them—and I argue that a visual demonstration is worth ten oral explanations.

The paint or lacquer used on war products is generally made by a reputable manufacturer to meet Government specifications — to be applied after it is reduced with a thinner that is recommended, and in accordance with the manufacturer's recommendations, on surfaces properly cleaned, and under proper atmospheric conditions.

What Causes Some Troubles You Complain About

While certain tolerances are allowed, it seems that general production practice fails to realize that the things mentioned here are fundamental requirements. As a result, many items are coated that are not clean; paints are not thoroughly stirred before and while product painting is going on; paints are not correctly reduced —that is, the wrong proportions of thinner and paint may be mixed, or the wrong thinner may be used. Dip tanks are not agitated; they

are not covered at night or between shifts to keep out dirt and reduce evaporation; the tanks are cold or chilled; the room temperature is not uniform.

Things are done wrong where and when they should be done correctly. Naturally the paint or lacquer job isn't satisfactory. A paint or lacquer service man is called in; he must find out what's been done wrong, then correct it and get the production line going again. And possibly a few days later the same condition occurs. This all represents a more or less serious wastage of time, material and manpower. I contend that anyone can be trained to do a good job of applying paint or lacquer; and today, women show an aptitude to do very well in this work.

Better Trained Foremen and Key Men are Needed

Management must do its part in visual demonstration and training, and check up closely on the key men, who take for granted that all they need to do is say some words and the new employe immediately knows what's what. Very often these foremen should receive training, in a like manner, with a visual demonstration, so they will know how to show someone else.

Five Different Finishes From Same Dip Tank

I saw a trailer truckload of finished war items, with five different finishes on them — and they all came out of the same dip tank. The load included several thousand pieces. The answer is that the paint material was mixed in various consistencies, yet it was all there in the tank, but not properly mixed — not agitated. When the material in the tank was thoroughly agitated, all of the pieces were the same, as to their finish, so someone was to blame. Who? I leave that to you. Here again, the paint service man was called in and asked what was wrong with the material. And in these days of shortages and transportation difficulties, a competent service man isn't always available the day you want him, or the next day either.

Clealiness and Correct Painting Technique Important

Adhesion is another chronic complaint on coatings. I have found that when the surface is right (clean and not too cold) you usually get good adhesion. Of course, the painting technique must be right too—and, last but highly important, the material must be right when it is used.

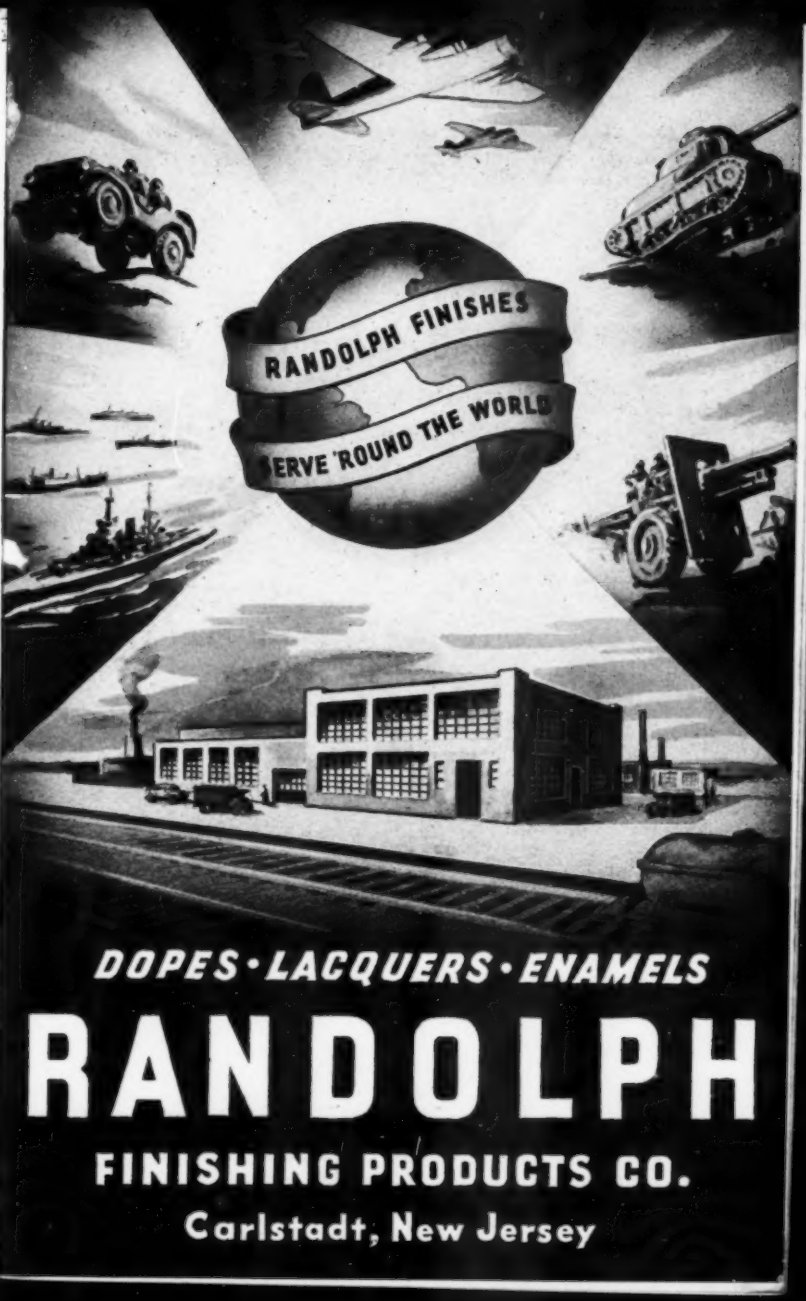
Clean spray equipment is another vital necessity for correct finishing. Moisture, oil or dirt in the airlines causes trouble. You must have the necessary volume of air needed; also, a uniform air-pressure in the fluid line. When spraying lacquers, a wet film is necessary; also a uniform temperature and no excessive humidity, to prevent blushing, etc.

For the past two years I have devoted most of my time to service on the production lines of war products, and have found that when all factors on the line are right, then rejects are few.

More Trouble Develops on Swing and Night Shifts

I have also found that after 10 A.M., the lines run better and continue so for the rest of the day shift. It's the swing shift and the night shift where most of the troubles develop. It is my contention that on these shifts, better supervision by management is required to eliminate trouble.

I have seen lusterless finishes,


RANDOLPH FINISHES
SERVE 'ROUND THE WORLD
DOPES • LACQUERS • ENAMELS
RANDOLPH
FINISHING PRODUCTS CO.
Carlstadt, New Jersey

made so on specification, produce glossy finishes due to lack of agitation. Also, I have seen dip tanks of some good finishes ruined because the wrong thinner was used, due to lack of control in the stock room or lack of proper lighting. Proper stock-room control suggests marking on drums and cans to let the user know, in his language or marking, the proper material to use. Again, it gets back to supervision on the part of the foreman—and the foreman knowing his job.

By this time a lot of readers are probably thinking that the paint manufacturer is back of this story, but I assure you that this is not so. The company I represent has the same problems with labor, and if it didn't use visual demonstrations in training key men or foremen, the same thing would happen to the paint or lacquer coatings we ship you—and this does happen occasionally. That is why I am always eager, day or night, to immediately follow up complaints on the production line.

I still wonder why anyone will run thousands of pieces on a line before trying to correct any trouble. The answer to this must be negligence on someone's part—or failure to discover the rejects in at least the first 100 or 200 pieces that are painted.

To Keep Production Moving

ROUND THE CLOCK operation imposes strains and wear and tear not found on ordinary production schedules. Add to this intensive war effort, bonus stimulation and the hazards of new untrained operators—and machinery of all sorts takes a beating.

When new or rebuilt production machines are sent to factories, where they are to be placed in service, it is desirable to send two sets of instructions, one attached to the machine and one for the office file. In the hurry and confusion, sometimes one or the other of these copies is mislaid. Then if there is no other copy, valuable time may be lost guessing "what this is for or how that works." Operators ask such questions and should be furnished with the information.

In view of the importance of war production lines it is essential to have daily inspections, to make sure that all parts of mechanical and electrical equipment are safe and functioning properly.—*Barrett Service Bulletin.*

Electric Heat Bakes Coating of Paint

APPLICATION of paint to pipe and sheet steel is growing apace, due to priority requirements on galvanizing. Some means of quickly drying paint that is applied to pipe and sheet stock is a necessity in many places. In answer to this need, one firm has developed an electric heater for this special purpose. For use on pipe, a transformer is fitted with extended leads equipped with tapered copper plugs.

In a test application of 1-in. pipe, the electric outfit brought the pipe to 195° F. in 30 seconds, with a 100-amp., 230-volt current input. From this point, the pipe was allowed to cool for 20 minutes to 130° F., at which point the paint was dry.

When the equipment is used on steel sheet, the extended leads from the transformer are equipped with clamps instead of the tapered plugs.—S. S.

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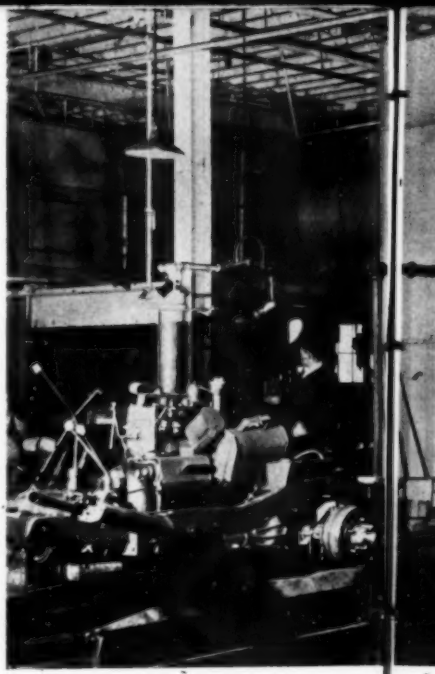
Developers and Manufacturers of Printing and Coating Flock

BY WILLIAM HOWLETT



Completely assembled chassis for Willys-built jeeps move on twin tracks for spray-painting as well as assembly work. The first painting is the application of a red oxide prime coat. Notice that the distributor, spark plugs, generator and other parts not to be painted are masked. The red oxide coat dries in a matter of minutes, as the chassis moves through a tunnel of infra-red lights, and is followed by an application of the familiar olive drab of the Army or the dark green of the Marine Corps, in similar spray booths. Excess spray is collected by the water wash on the far side of the track and is reclaimed.

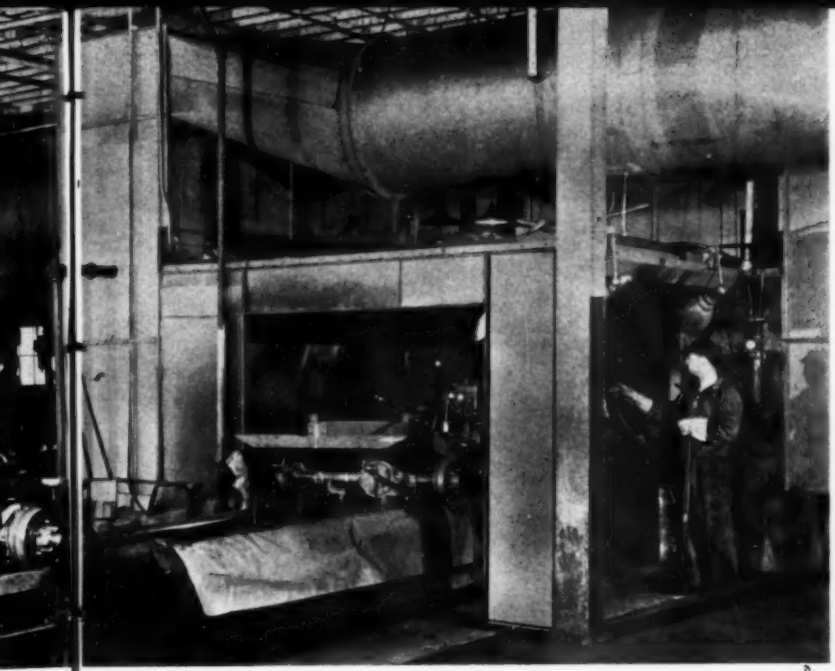
☆ Dressing the Willys J

THE now-famous jeep is strictly a mass-production weapon, and the techniques used by Willys-Overland Motors—its designer—in applying its battle dress are borrowed largely from the assembly lines which, before the war, turned out civilian automobiles.

Naturally, these techniques have been varied and perfected to meet the many problems peculiar to the diminutive scout car. Using water-wash spray booths, the jeeps are painted first with a red oxide primer, and then with a finish coat of the familiar Army olive drab or the less familiar dark Marine green.

On each of the two Willys-Overland assembly lines are located two spraying stations. The first is for the prime coat, and the second is for the finish coat. Each of these stations consists of a staggered type of water-wash spray booth, a dead-end pressure material feed system, air pressure regulator and condenser, air and fluid hose, and standard production spray gun.

The water-wash spray booths, for the primer coat, are in two 10-ft. sections positioned end to end but facing in opposite directions, parallel to the line, so that the operator in the second section sprays the other side. Booths for



...ys Jeep for Battle ☆ ☆ ☆

the finish coat are of the same type and arrangement except that they are in 14-ft. sections.

Pressure Feed Paint System

Paint is fed to each of the four spray stations by means of a dead-end pressure system which consists of a 60-gallon pressure-feed tank from which the paint is piped to an outlet valve in the booth. To this valve the fluid hose leading to the spray gun is connected. Continuous agitation within the tank keeps the paint in correct suspension for spraying.

Compressed air is piped to an air transformer mounted within each section of each spray booth. Here all dirt, oil and other foreign substances in the compressed air are removed and its pressure is adjusted for best spraying results. This transformer and the paint outlet valve are located high on the side of the booth. The hose leading from them to the spray gun is just long enough to give the operator freedom of motion without dragging the hose on the floor too much, either when the gun is in use or when it is hung up between operations.

The spray gun at each of the spray stations is equipped with the nozzle combination and adjusted as

to fluid flow and air pressure to give the best performance in speed, coverage and quality of finish. Guns used are the standard hand-type production model equipped with the latest fluid control and spray-width adjustment valves.

Paint on Chassis Dries By Infra-Red Lights

Following each series of spray booths is a battery of infra-red drying lamps through which the chassis pass after they are painted. This arrangement of spraying stations provides facilities for the thorough and complete painting of the chassis without undue strain or pressure on the operator, working at full conveyor speed.

The chassis move, by conveyor, through a 60-ft. tunnel of infra-red drying lamps. It requires ten minutes for a chassis to pass through the tunnel, during which time the paint coating is baked at a temperature of 225° F. The same time and heat are used on both the red and oxide primer and olive drab coats.

After the prime-coated body is mounted on the painted chassis, the completed jeep is spray-painted olive drab or Marine green and moved through a steam-heated oven to dry the paint. This oven is 140-ft. long; its temperature is maintained at 200° F.; and the jeep requires 35 minutes to pass through it by conveyor.

The specification olive drab paint is obtained from two different sources. The material is cut 15% with reducer, regardless of whether the paint is to be dried in the tunnel of infra-red lights or in the long steam-heated oven. Small parts and wheels are spray-painted and dried with the same equipment that is used for chassis and bodies.

Although this painting installation was designed for efficient production, it has been responsible for unusual economies in operation. It is estimated by Willys-Overland production experts that the water-wash spray booths paid for themselves in less than a year, out of savings in maintenance costs, as compared to the old style dry booths which had been previously used. To this must be added the annual reclamation of more than $15,000 worth of paint.

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Different Processes for Cleaning Metal

Part I of a two-part article wherein the author emphasizes the necessity of cleaning all metal surfaces in preparation for painting . . and describes briefly some of the different processes used for this work.

BY G. C. CLOSE

A GOOD finish job is the result of a series of carefully planned and skillfully executed operations or processes. Omission of a single operation, or faulty application of the process involved, will often lead to disastrous results.

Proper cleaning of surfaces to be finished is the initial and one of the most important operations with which the finish engineer has to cope. This is especially true when non-porous materials such as metals are involved. Any finish depends on adequate bonding to demonstrate either its protective or decorative qualities. To attain a good bond, it is necessary that the finishing material make intimate contact with the surface to which it is applied.

When a thin film of foreign substance (such as dirt, soapy or oily scum, grease, wax or acid solution —even though it is only partially complete, and perhaps invisible) separates the finishing material from the metal surface, poor bonding will result. Under such conditions the best finishes available, applied by the most skillful workmen, will not give dependable service.

Metal cleaning is not a new process. The earliest painters realized the importance of having a clean surface on which to spread their primitive coating materials. Also, it was discovered that methods of cleaning must vary to suit the individual characteristics of different metals being cleaned.

The importance of using different cleaners and different cleaning methods for various metals was accentuated by the development of chemical cleaning. It was quickly discovered that the strong alkaline cleaners used with steel would injure if not actually dissolve the lighter metals such as magnesium and aluminum.

Variety of Cleaning Materials and Processes Available

Modern development of an extremely complex industry, involving the manufacture of machines wherein many different metals and alloys are used, created a demand for specific cleaning methods to serve individual purposes and materials. Such a demand brought into existence a variety of cleaning materials and processes, some of them rather complex. War and the subsequent transformation in many

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industries made necessary the adoption of new and unfamiliar cleaning methods.

For convenience, metal cleaning processes can be divided into two categories, i.e., mechanical cleaning processes and chemical cleaning processes. A mechanical cleaning process may be defined as a cleaning process wherein physical violence plays a major role in removing dirt from the metal. Chemical cleaning is accomplished principally by chemical reaction. Basically, the processes are as follows:

Mechanical cleaning processes

Hand wiping
Grit blasting
Rolling and tumbling
Shot blasting

Chemical cleaning processes

Hot still-tank cleaning
Emulsion degreasing
Electro-cleaning
Steam vapor cleaning
Acid pickling
Phosphatizing

For some cleaning processes two or more different cleaning operations may be required. Emulsion degreasing, for instance, is often used to remove heavier deposits of grease from parts and to reduce the overall time necessary for finish cleaning in the hot still tank. The use of multiple cleaning operations is, however, largely a matter of trial and experience.

Mechanical Cleaning Processes; Hand Wiping

Hand wiping, the oldest of metal cleaning methods, is still used for cleaning finished structures, parts, and assemblies that are too large to be accommodated in automatic cleaning equipment. When not necessary, however, hand wiping is not recommended due to the time involved and the general inefficiency of the process.

An adequate supply of clean soft rags, wet with suitable solvent of thinner, is required. It is also necessary that provision be made for disposal of the rags after use. Solvents generally used for hand wiping are highly inflammable, and dirty wiping rags should not be allowed to accumulate in piles, or be allowed to remain for any length of time with other inflammable materials, due to the inherent danger of spontaneous combustion. One method of rag disposal is to provide containers of water into which the used rags may be placed. A better method is to provide for periodic pickup of the rags and their removal to safe storage until they are cleaned.

The too common practice of adding carbon tetrachloride to the solvent to reduce inflammability is to be strongly discouraged. Not only is an excessive amount of the reagent required, but the fumes given off from such a mixture are both narcotic and toxic when breathed.

Blast Cleaning—A Form of Dry Cleaning

Grit-blasting is used for a wide variety of cleaning jobs. . . .

Metals of relatively thick cross-section are usually grit-blasted with a heavy grit, while thin sheet metal work is generally cleaned with a fine grit such as No. 90 (.008-in. diameter). The fine grit is also used for preparing aluminum and the softer alloys.

Parts of close tolerance can be lightly grit-blasted because generally there is not enough metal removed to affect tolerance—at any rate allowance can be made prior to blasting if there is any fear of "over-blasting" the surface.

Although sheet stock tends to warp when high pressure grit-blasting is applied to one side only, when the blast is applied to both sides simultaneously you obtain a smooth plane surface. *(To page 50)*

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The size and type of grit to use depends upon subsequent finishing practice. When a part is to be metallized, a relatively coarse steel grit is recommended. For electroplating and general cleaning, a finer grit may be used. In all cases, provisions should be made to remove "fines" or pulverized grit as it develops during use. This is done by means of an air-wash in an abrasive separator.

A raw grit-blasted surface is prone to rapid oxidation, especially if touched by the human hand; therefore blast-cleaned surfaces should be coated, or at least primed, as quickly as possible after being cleaned.

On highly stressed parts, where minimum design safety factors are involved, such as are often found in the aviation industry, the cutting action of the grit particles will open up and disclose minute fissures otherwise undetected in the surface of the parts. These fissures might later develop into areas of stress concentration, unless the metal is rejected before going into final assembly.

Shot-Blasting

Shot-blasting is employed for removing foundry sand and heavy scale from forgings, castings, heat-treated work, etc. The cleaning is accomplished by the impact action of the shot in breaking the scale from the surface of the part being cleaned. Modern shot-blasting today is usually handled in airless blast-cleaning machines because of their rapid and effective cleaning. The shot or other abrasive is hurled by centrifugal force, rather than by air pressure, from rotating bladed wheel.

One of the latest and most far-reaching developments in this field is a process known as "peening," wherein shot-blasting is used to relieve surface tension in metal parts, thereby adding to their useful life.

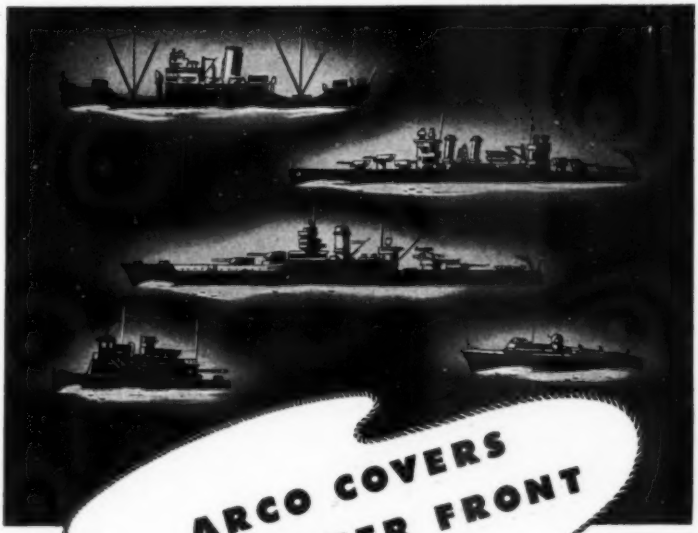
Cleaning by Tumbling

The tumbling process is often used to clean and roughly smooth the surfaces of small castings preparatory to painting. A variety of tumbling barrels are available for this purpose. The barrel is usually loaded so it is not more than three-fourths full, and rotated 20 to 30-r.p.m. — sometimes a little slower, sometimes a little faster, depending upon the size of the parts, the type of barrel used, and other factors.

Slugs, jacks, slag, emery, pumice, trap rock, sharp sand, or some other material having sharp edges that will cut or wear down the rough surfaces, can be placed in the tumbling barrel with the articles to be cleaned. The tumbling can be either wet or dry, depending on the facilities available. Wet tumbling is generally faster in action. In the case of steel or metal parts that rust, an alkaline may be added to the load to prevent quick rusting. If parts are quickly and thoroughly dried immediately after tumbling, there is less danger of them rusting.

Chemical Cleaning—
Hot Water Solutions

Hot water solution cleaning, which generally consists of using proprietary alkali cleaners in still-tanks, is one of the oldest and simplest of the solution cleaning processes. It is still employed extensively, especially in small industries where a few each of parts of diversified shape and form are handled. There is a modern tendency for mechanical washing machines to replace the still tanks, particularly where high production procedures and very large numbers



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Two coats of finish were being used, which the Du Pont War Service Man knew *should* provide an economical and attractive finish. Using a micrometer to determine the film thickness, he found that the manufacturer was applying an undercoat of 1 mil thickness and an enamel topcoat of 2 mils. Since there was more pigment in the undercoat than in the topcoat, he recommended increasing the basecoat to 1.7 mils. An ideal basecoat with complete hiding resulted. This permitted a reduction in the thickness of the more costly topcoat from 2mils to 1.3 mils. Although the total film thickness remained unchanged, a better looking finish was obtained and finishing costs were cut.

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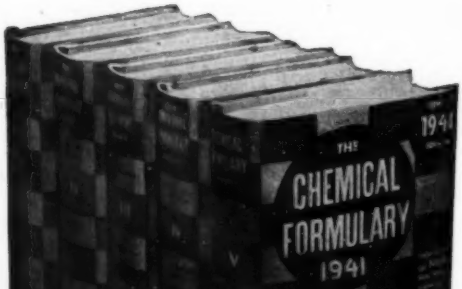

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INDUSTRIAL FINISHING *Magazine*

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of generally uniform parts are to be treated. In the washing machines, parts are moved through the cleaning solution by some type of conveyor.

Still-tank cleaning solutions are of an alkaline or caustic character. The strength of the solution may be varied to suit the requirements of the work being cleaned. A number of commercial cleaners are available, most of them conforming to well known cleaning formulas, and any reliable manufacturer will gladly recommend a suitable type of cleaner to use for specific types of work.

The most effective method of obtaining speed and economy of cleaning with the hot still-tank method is to provide a number of tanks, each containing a solution carefully adjusted to the type of work it will perform. Each tank should be provided with a suitable means of agitating the solution, and it should have an outlet for convenient drainage when the solution is changed.

Agitation of Cleaning Solution in Still Tanks

A simple method of obtaining agitation is to install steam coils on the side of the tank from which work is withdrawn. Compressed air for agitation is rarely used, as it introduces oxygen and other gases into the cleaning solution, thus causing tarnish on non-ferrous alloys of brass, bronze, silver, etc. It usually induces foaming. Beyond that, compressed air tends to cool the solution, therefore more heat is required to maintain it at correct operating efficiency.

Effectiveness of Cleaner

Penetration of the solution through the dirt film on the work is assured by the addition of emulsifying soaps and wetting agents. Complete penetration is necessary to properly emulsify the adherent dirt so that it can be removed by subsequent rinsing. The alkalinity of still-tank solutions may be maintained by the addition of buffer salts, but in each case the salt to be added should be recommended by the manufacturer.

(To be continued)

Color and Synesthesia

FROM the Color Research Laboratory of the Eagle Printing Ink Co., Division General Printing Ink Corp., New York 13, N. Y., comes a few interesting notes on synesthesia, or what is frequently termed occupational neurosis. This, in other words, is akin to civilian shell-shock.

In a booklet issued by the U. S. Department of Labor the statement is made that "Eye strain contributes to neurasthenia." One effective way to meet it consists of a better and more appropriate use of color in the factory—both to establish the best of seeing conditions and to create more comfortable and agreeable environments.

Color holds a lot of magic to people. As one safety expert puts it, "If slums are responsible for crime, then the drab and ashen surroundings of many plants are responsible for accidents." Eagle has gathered numerous references on the application of color to industry and will be happy to pass the information on to anyone interested.—HERBERT KAUFMAN.

Under the usual drying conditions, a week-old lacquer film may contain as high as 5% to 8% of volatile solvents.

Painting Interiors of Fabricated Steel Ships

A man on the job tells about how surfaces are cleaned and prepared for painting, how various special coatings are applied and dried to protect exposed and covered places on our fabricated steel ships.

BY HENRY NOVAK

STEEL fabricated sections and sub-assemblies for the production of sea-going ships are delivered to our ship-building site from various inland plants. For instance, these include the holds which are the bottom sections, both port and starboard side as complete units, third and second decks combined in compartments, booby hatches, deck house, wheel house, etc. These are put in place by large crawler cranes and then welded together.

As a rule, these steel sections lay outside, exposed to the weather, for quite some time before being cleaned and primed. This weathering loosens and removes the mill scale. Many sections of the ship have all scale removed by this weathering process before they are painted. There is no pickling or rustproofing done.

Power Wire Brushing

After the holds are air-tested for leaks in the welded seams, and are found to be all right, they are wire-brushed with pneumatic-driven rotary brushes. Some of the brushes are of the cup type. Others are 6, 8 and 10-in. radial wheel brushes.

The cup-type brushes are used on flat surfaces. Spiral brushes are used in angles and on stiffeners, saving a considerable number of man hours as against the hand wire brushing which is still being done in many places. Spiral brushes are also used to remove slag and for cleaning welds. Many power brush operators use the spiral brushes for flat surfaces too. Wire diameter size is .014-in. and .016-in. and some .035-in. When in continuous service a wire brush lasts about 40 hours.

The power-brush operators wear goggles to protect their eyes from flying particles of steel, mill scale and bits of wire from the brushes. One operator, who was blind in one eye, lost his other eye because he neglected to put on his goggles. The men also use respirators, as this is a very dusty job. Hand cleaners with 4-row hand wire brushes and stiff scrapers clean places that can not be reached satisfactorily with the large power brushes.

Ventilation for Workmen

Ventilation is provided by flexible suction piping and exhaust fans. There is a separate ventilation crew that takes care of the

*Interior of Chicago Aircraft Assembly Plant of Douglas Aircraft Co., Inc., the largest "all timber" factory in the world. Here the famous Skymaster cargo transports are being built. Photo courtesy Austin Co.

TO COMPLETE this modern aircraft plant in record time, H. Knudsen & Co., painting contractors, used Paasche High Production Airpainting Units to spray over 5,000,000 square feet surface, in record time.

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AIRBRUSH

Increases speed of production in three ways:—(1) Light weight, perfect balance and hand-molded grip, enable operator to work longer hours at top speed. (2) The superior performance of the Paasche Gun speeds up rate of production. (3) Quick cleaning—less maintenance—increases time gun is actually spraying.

Get the facts in Bulletin FM9-42 on this Paasche Gun and other Paasche Airpainting Equipment. Write today.

Paasche AIRPAINTING EQUIPMENT

Manual, automatic and special airpainting equipment, airfinishing booths, pressure regulators, airconditioners for compressed air lines, air dusters and strippers.

steel cleaners and painters. The foreman of this crew checks in every so often to see where ventilation is needed or wanted. The day foreman leaves a list indicating where ventilation is wanted for the night shift, so that no man-hours are lost waiting for necessary ventilation.

Advance Painting on Areas That Will be Covered

After box sections are assembled, an advance crew of painters goes ahead and paints both the prime and finish coats on areas that later will be covered, hidden, contacted, or made inaccessible by the installation of such equipment as switchboards, most of the wiring, switchboxes, fixtures, motors, ventilation ducts, fans, blowers, degaussing system, Fiberglas insulation, bunks, lockers, hot pipes.

The foreman of this crew is notified by foremen of other crafts as to where, when, and on what ship they plan to install certain equipment. Then he sends some of his painters with the correct paint to finish those locations. He and his crew work in as many as 15 ships a day. If the foreman of advance painters isn't on one of the ships that requires painting, he calls in at a central location where the other foremen call and leave their requests. He knows where the inaccessible places are and in most cases does not wait for an order—except where welding is still to be done and must be inspected by Navy inspectors before painting.

Bituminous Coatings Are Put on Hot

A bituminous primer and enamel is used under all inaccessible engine foundations such as the main diesel and auxiliary engines, ice-making machines, rudder control engine, under equipment in galley which is constantly wet, all bitts, chocks, elevator ramps, winches, reels, fairwaters, skegs, spare anchor, anchor-chain locker deck, etc.

The steel must be absolutely free from scale, rust, dirt and grease. Particular care should be taken to see that the steel is almost polished. We apply a coat of bituminous primer on the clean steel, putting it on evenly with a brush. When the primer coat is tacky, we apply one coat of hot bituminous enamel. We do not allow the primer to dry more than 24 hours, as otherwise the hot enamel would not adhere to it. The bituminous enamel comes in solid lumps. It is melted in a kettle or steel drum at a temperature of about 500° F.

Technique of Brushing on Hot Bituminous Coating

The hot liquid is brushed on with a small brush, starting at the bottom and working upward so the workman won't have to brush over streamers or runs — as he would if he started at the top and worked down. Special care must be taken to see that no "holidays" or skipped places remain. It is difficult to distinguish between the primer and the enamel, as both are black. The enamel should be brushed on, 1/16 to ⅛-in. in thickness. For areas that are constantly wet and subjected to seawater, the thickness should be nearer ¼-in.

The skeg (the enclosed section at the stern of the ship where the propulsion shaft emerges through the stern hull, just forward of the propeller) is primed and hot enameled or coated with rust-preventive compound prior to being closed by welding the inboard plate into position. In some cases, the skeg is filled with asphaltum varnish after being air tested for

Glamour at Christmas Time

What is it that makes the packages under the Christmas tree so sparkling and attractive? It's finish! It's the way they are embellished with colorful papers, ribbons and a sprig of holly.

The same line of reasoning applies to commercial products. Make them attractive . . . make them sparkle with individuality . . . by applying an unusual rich finish.

Use our Creative Studio service . . . let us suggest our ideas as to how your product can be made a stand-out in your line. This service is offered without charge to reputable firms.

Even though your present production is limited to war products post-war preparedness will pay dividends.

Your inquiry will receive prompt attention.

No Tampering with Quality

ROCKFORD VARNISH Company
ROCKFORD, ILLINOIS

Manufacturers of Protective and Decorative Coatings

leaks. The skegs on these ships hold approximately 800 gallons each. These are filled by pressure so that all sections are saturated —which also simplifies the filling operation. The varnish is held within for a certain length of time and then drained out at the bottom of the skeg through a large bung. The fairwater, forward of the rudders (the section where the rudder swings) is finished in the same way.

The interiors of rudders are finished with asphaltum varnish or bituminous enamel. When tested and found to leak they must be filled and moved about or swashed so that all inside surfaces are coated. These usually come in ready coated. However, if a leak is found, that place must be rewelded, which burns off the coating and therefore calls for re-coating.

Under the engines the main and auxiliary rooms are bituminous-primed and hot enameled. The balance is cleaned and one coat of zinc chromate primer is either brushed or sprayed on. This is followed by one coat of a gray fire-retardant and salt-water-resisting synthetic paint, brushed or sprayed. This applies also to the bilge control room and shaft alleys. A wainscoting of about 4-ft. or 5-ft. in height is painted all around these rooms in the same color paint. This is all done before the engines and piping are installed. This saves a tremendous amount of man hours both in cleaning and painting.

In some ships the bilges are painted white, so that oil leaks can be detected easily. These bilges should be well painted because they are partially filled with water for detecting oil leaks by the floating oil on the water.

After engines are cleaned with a Stoddard solvent (a mineral spirit recommended by insurance inspectors), all label plates, governors, valves, diaphrams, gages, etc., are masked and the engines are sprayed with a light gray oil-resisting, heat-resisting enamel.

Masking; Identification Color

As a rule, all valve heads and grease cups are painted red or some other bright color for easy identification. This is usually done throughout the ship, with the exception of officers' quarters which are painted to conform with the surrounding color for appearance. The same applies to auxiliary engines, steering gear and machinery throughout the ship. Cloth tie bags, such as shipping bags, are used to mask the valves while spraying. This saves a lot of time, and the bags can be used over and over again.

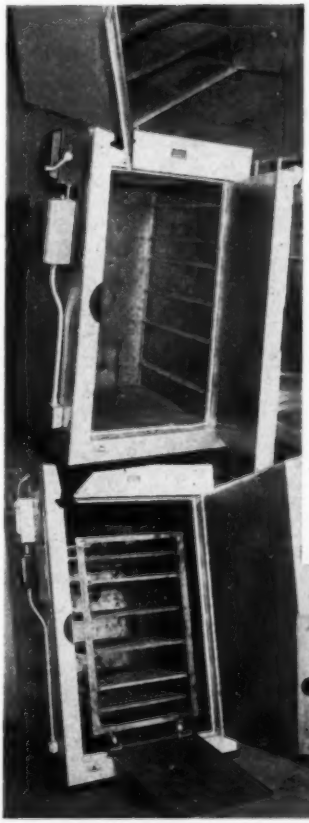
While painting the shaft alleys, extreme care must be taken to see that no paint is applied on the propulsion shaft bearings and couplings, due to lining up the shafts after the ship is launched. The balance of the bulkheads are painted a pale green, using a fire-retardant paint. The battery racks and areas in the way of batteries receive two coats of black acid-resisting paint over the bare steel. In many cases the two coats are applied over one coat of zinc primer, which is advisable. The interiors of ventilation ducts over the batteries are coated with acid-resisting paint.

Zinc Chromate Primer

Priming with zinc chromate is done as soon as compartments have been passed by hull inspectors. Above the third deck they receive only a visual inspection. As soon as other crafts have installed all of their equipment (such as elec-

KOCH

OVENS



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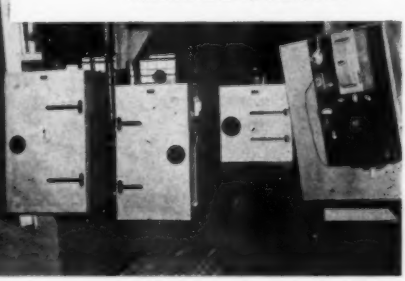

tric wiring, light fixtures, switches, switch-boxes, fans, motors, etc.; the ventilation department with their ducts, blowers, etc.; carpenters with their Fiberglas, rigid hull insulation, which is on second deck and deckhouse only; pipe insulators in covering their pipe with asbestos and canvas, and magnesium insulating; the outfitters with their bunks, berths, lockers, work benches, galley, pantry scullery, medical stores equipment) the ship is then ready for its finish coat.

Finish Coatings Applied

The sides and top, in certain sections, are painted with light green fire-retardant paint. Care must be taken to apply only one coat over the primer, to a certain thickness. There must be no more than this one coat. This point is stressed very much, due to fire hazard during combat duty. Special fittings are used to keep the spray mist off the light bulbs while painting. Thermostats, label plates, and articles not to be painted, are masked with scotch tape. The water-tight doors are hand brushed on the side that has the rubber gasket. No rubber should be painted whatsoever, as the paint causes it to deteriorate rapidly. Oil and grease must be kept off rubber surfaces too.

The decks are painted with a light gray fire-retardant enamel which will not show dirt as readily as a dark deck paint. Also, spaces where the light gray paint wears through to the steel do not show so distinctly because it is nearly the color of polished steel.

Treatment for Fuel Tanks

The fuel oil tanks must be absolutely free from scale, rust and paint. These are thoroughly power-brushed and all painted identification marks are removed. They are practically polished. Then they are given a coat of non-volatile oil, such as lubricating oil, if fuel isn't to be put in them for a considerable length of time. This is to avoid the possibility of rust forming on the surface. Fuel oil isn't used as a coating, as it is combustible and might cause an explosion in confined spaces from welding or burning sparks. Sludge tanks and lubricating oil tanks are cleaned and finished like the large fuel oil tanks.

All void spaces, ballast tanks, the dry sides of sea chests, peaks and blisters are given one coat of zinc chromate primer and one coat of white fire-retardant paint. There is less radiation of heat, in case of fire, when tanks are coated with white, as against just being primed or with the bare steel exposed. The serrated angles and all angle irons, stiffeners and frames must be thoroughly coated so they will not rust, as condensation is quite heavy on the interior of steel ships.

Inspectors Use Mirrors

Mirrors are used by inspectors to see that all angles are coated, and all other places that can't be seen without them. Some painters have the idea that it isn't necessary to paint behind angles because those areas can't be seen, but these are the places the Navy inspectors check closely. A special swivel-angle spray gun is used, which does a very fast efficient job. Fumes and spray mist are removed as much as possible, by the exhaust fans. It is the same equipment that is used for removing dust from the steel surface cleaning operations.

Many confined spaces, where it is impossible to use spray guns, are brush painted. We use many 2-in. sash tools, cut, bent and soldered

HILO RIP-PL FINISHES

Performing Scores of Important War Duties on Every Front!

The new Hilo Rip-pl Finishes are seeing service—and we do mean *service*—everywhere! Despite the absence of chinawood oil, these new Hilo coatings wrinkle and bake as well as old-type finishes, and they're right up to the old standards in exterior durability, salt spray resistance, toughness of finish and beauty of design.

Samples and Bulletins on Request.

HILO

Established 1863

HILO VARNISH CORP.

42-60 STEWART AVENUE BROOKLYN, 6 N. Y.

CHICAGO: 2420 Washburne Ave. BOSTON: Park Square Bldg.

to 45° (some 60° and "tomahawk" shape) to paint many hard-to-reach places.

The chain locker room, where the forward anchor chain drops when hauled up, is coated with bituminous primer and hot bituminous enamel below the perforated plates. This is subject to sea water and must have a suitable coating for protecting against salt water which would corrode unprotected steel very rapidly. The balance of the room receives two coats of asphaltum varnish.

The galley, medical stores, scullery, pantry, all washrooms, showers and water closets are painted with fire-retardant semi-gloss white. Decks in washroom, showers and water closets are painted with acid-resisting light gray deck enamel. It is used because the ordinary deck enamel would be softened by the extreme soapy condition of the water and body acid. A gray dado of about 4-in. to 5-in. is painted, with the same gray acid-resisting paint, around the complete compartments.

Non-Skid Deck Covering

In the crew's quarters the deck is covered with a non-skid deck covering. This covering is also in the passageways and in all staterooms in the officers' quarters, and over a large section on the main deck and hand-rudder control machine area. It is also put at each side of the doors, in pads on the deck, so a person won't slip while stepping over the "threshhold."

The deck is thoroughly cleaned of mill scale, rust, dirt and grease or oil by power brushing, and then given an acid solution wash. This acid is diluted with water. In cold freezing weather, alcohol is added to prevent the solution from freezing on the steel. This acid solution removes any traces of rust in pitted surfaces and it etches the steel slightly for bond. The workmen wear rubber gloves and apply the acid solution with a wire brush or coase steel wool. The acid solution is washed off with clean water and the surfaces are dried thoroughly, as quickly as possible. Then they are covered with a special zinc chromate primer, applied by brush or spray.

This primer is reduced very thin and a very light coat is applied. After it has dried thoroughly, the deck covering is applied by trowel. It is coarse and can't be worked back and forth. Only a few strokes should be taken; otherwise it will roll. It should be trowelled to about 1/16-in. in thickness. This material is tough and slip-proof. When it is dry it is fireproof. It comes in shades of deck blue and gray, and in red to match the red linoleum that is ordinarly used in officers' quarters, etc. It withstands shock, such as from heavy gun fire. It is also used on the decks of gun platforms. (This deck coating material is also made for spray application.)

Editor's Note: This is Part I of the author's article. Part II will be published in a later issue.

H. S. Tweedy Appointed Detrex Service Manager

W. W. Davidson, vice-president of Detrex Corp., Detroit 27, Mich., metal-cleaning engineers, announces the appointment of Harry S. Tweedy as manager, Field Service Division.

Mr. Tweedy has been chief inspector of production in all Detrex plants since December, 1940. Prior to that time he served for four years as a design engineer. Until recently, Mr. Tweedy has also been a member of the faculty of the University of Detroit and is a registered engineer.

SEA-LAC FACTS

Published Now and Then by **DURALAC CHEMICAL CORP.**

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A FEW OF "SEA-LAC'S" PROTECTIVE COATINGS IN PAST AND PRESENT SERVICE

ZINC CHROMATE AND OTHER PRIMERS

For Aluminum Alloys, Steel, Cadmium and Other Metals

METAL AND PLASTIC FINISHES

High Soap and Heat Resistance
Salt Spray and Solvent Resistance
Low Moisture Permeability
Coatings for Protection Under Continuous or High Water Pressure

AIRCRAFT DOPES

WRINKLES—NO CRITICAL OILS

STRIP COATINGS FOR MASKING OPERATIONS

(Solvent or Waterproof)

WATER DIP LACQUERS

ADHESIVES, QUICK-DRYING

Fabric to Fabric
Cellophane to Fabric
Onion Skin to Metal
Rubber Cement Substitute, Requiring No Curing
Acetate Cement
Hard Rubber to Wood and Plastic

CEMENTS, HEAT SEALING

Paper to Metal
Paper to Paper
Metal to Cloth

COATINGS FOR FABRICS

Waterproof, Gasproof and Flameproof Coatings for
Cotton, Rayon
Silk and Straw

We could go on and on, as the list is practically inexhaustible. Some are serving at the front now. Some have served industry before. All will serve the nation in time to come.

There is an answer to every finishing problem. We either have it, or will formulate it for you without incurring obligation on your part. If it is a finishing problem whether metal, wood, fabric, or any other surface, chances are good that Duralac Chemical Corporation has an answer for it. Submit your problems for our recommendations.

DURALAC CHEMICAL CORPORATION

LISTER AVENUE, NEWARK 5, N. J.

Materials Supplies Equipment

Freehand Electrical Marker

H. P. Preis Engraving Machine Co., 157 Summit St., Newark, N. J., announces the addition to its marking equipment line of a device for placing numbers, symbols, and identifications on metal surfaces.

The marking point is made of a special long-life heat-resisting alloy and is threaded into the holder at an angle so that it stands vertical to the work when the holder is placed in a normal writing position. The holder remains cool throughout continuous operation.

Use of this device affords a clean, fast, and economical marking method, requiring a minimum of cleaning and surface preparation. The Electro-Marker is available for alternating current, 115 or 230 volts; 25, 50, or 60 cycles.

New Lacquer Announced

In time to ease the shortage of ester solvents, Hercules Powder Co. chemists have developed a new grade of nitrocellulose having greater solubility in alcohol, the company announces.

Requiring a minimum of ester solvents, Hercules SS nitrocellulose is finding wide application in the production of high-quality lacquers. Tests indicate that SS nitrocellulose, which is available in four viscosities (¼, ½, 5-6, and 40-60 seconds), can be used in wood sealers, wood lacquers, printing inks, heat-sealing adhesives, and other special uses.

Tests conducted over the past year have determined the solubility of SS nitrocellulose in a variety of solvent mixtures comprising large proportions of alcohol, or alcohols with miner proportions of an aromatic hydrocarbon and an ester solvent—ethyl acetate. Triangular diagrams charting these results are available upon request.

It was found that the small amount of ester solvent required to dissolve SS produces lacquers that will spray satisfactorily under average conditions withodt blushing, and that will dry with very little orange peel or other imperfections, the company stated.

Hercules reports that SS lacquers possess the same properties of standard nitrocellulose lacquers, including quick-dry, flexibility, toughness, durability, and chemical resistance. Based on the relative supply picture of alcohol and of ester solvents, SS nitrocellulose is believed to have good postwar prospects. The Company's headquarters is at Wilmington, Del.

Box-Type Ovens for Baking Enamels

The Industrial Oven Engineering Company, 11621 Detroit Avenue, Cleveland, is now producing a standard box-type oven in several standard sizes for a variety of batch heating purposes. It uses any commercial oven fuel including electricity. Door sizes range from 3-ft. wide by 5-ft. high to 5-ft. wide by 7-ft. high, with working depths from 4 to 10-ft.

Heating equipment is built into the oven shell, and the oven is shipped assembled, ready to operate except for the attachment of accessories. Ductwork is likewise built in, and is arranged for cross flow and vertical air passage, affording positive and rapid circulation through a relatively dense work load. Recirculation and exhaust ducts are arranged to prevent belching or leaking at the door opening.

One of the principal features is close temperature tolerance within limits from 200° to 1,000° F. On high-

Perfection in—

WRINKLE FINISH!

FREE FROM CHINA WOOD OIL

To conform with the Government regulation prohibiting the use of china wood oil, and to maintain the splendid reputation of Yarnall Wrinkle Finish—the Yarnall laboratories, after extensive research and field tests developed a new Wrinkle—one whose qualities stand up to every test—and during the past year has been used by some of the largest wrinkle finish users.

IF YOU WANT—

SURFACE PROTECTION
RESISTANCE TO THE ELEMENTS
FREEDOM FROM GLARE
EYE APPEAL
COVER SURFACE IMPERFECTIONS
COMPLETE SATISFACTION

USE THE NEW—

YARNALL WRINKLE FINISH

Write for complete information

YARNALL PAINT CO.
Industrial Division
PHILADELPHIA - - - - PENNSYLVANIA

temperature units, inside panels are made of steel plates with heat affected parts of chrome and chrome-nickel alloys. Ovens can be furnished with or without positive exhaust fan systems, depending on the processes for which they are to be used.

Standard temperature controls are expansion recording thermometer type or millivoltmeter type, depending on accuracy of control required. Full electric safety equipment protects the system against flame, current or air failure.

These ovens can be used with trucks or racks for steel strip dehydrogenizing, aluminum heat treating, stress relieving of N. E. alloys, metal finishing, curing of synthetic resins, tempering and blueing of steel parts, and a number of other miscellaneous applications.

Portable Spray Outfits for U. S. Engineers

The illustration marked Fig. 1 shows a Binks compact chest outfit, containing two 5-gallon pressure material tanks, two spray guns, hose and all accessories for a 2-man spray outfit, all completely packed in a sturdy chest according to U. S. Engineers' specifications.

Fig. 1—Compact chest outfit of spray equipment for U. S. Army Engineers.

In Fig. 2 you see the sturdy wheelbarrow-type compressor outfit, weighing less than 225-lbs. net, which is used to power the spray equipment, and which is of sufficient capacity to operate the 2-man outfit.

These outfits are being shipped to U. S. Army Engineer Depots throughout the world for use in camouflage work, and for general maintenance painting.

The contracts with the U. S. Engineers on these outfits are of sufficient size to warrant the entire attention and space of Plant No. 2, and thus segregate this plant's operation from all the regular work of the Binks main plant at 3114 Carroll Ave., Chicago, Ill.

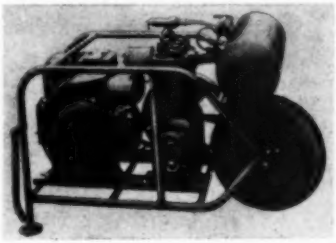


Fig. 2—The wheelbarrow-type compressor furnishes compressed air.

Better Fire Extinguisher

The "Squeez-Grip" type valve for hand-type carbon dioxide fire extinguishers, originated and developed by the C-O-Two Fire Equipment Co., Newark, N. J., has been adopted as standard by the U. S. Navy Bureou of Ships. The valve has also passed tests of the U. S. Bureau of Standards and is on the approved listing of the Coast Guard Merchant Marine Committee for use on passenger and cargo vessels in accordance with U. S. Senate Report No. 184.

The features of the "Squeez-Grip," which C-O-Two designers believe had most to do with its recognition by the armed services as an improvement over the hand-wheel or older type valves, are its ease of operation.

BOMBERS' *ignition cables need a finish that can* TAKE IT!

Drawn from an official U.S. A.A.F. Photo

The finish on aeronautical high-tension ignition cable must withstand temperatures from +400° F. to —40° F. It must be flexible, slow-burning, ozone resistant! Must stand up under cracking tests, salt water, hot oils and high octane gasoline! . . .

Ault & Wiborg was the first to develop a wire coating lacquer to meet these and other stringent applicable requirements. Working in cooperation with wire manufacturers and rubber manufacturers, we were instrumental in developing a new type of aircraft ignition wire. It is helping our bombers to stay in the air today . . . It will help to prevent ignition breakdowns in the automobile of tomorrow!

What Are Your Finishing Problems?

Ault & Wiborg finishes — protective and decorative — have solved finishing problems for manufacturers of washing machines, kitchen cabinets, automobile equipment and many other types of metal and wood products. If you are experiencing difficulties in finishing your wartime product, or would like to make plans now for your future peacetime finishes, let Ault & Wiborg technicians tackle the job with *you!* Write today to Ault & Wiborg Division of Interchemical Corporation, Empire State Building, 350 Fifth Avenue, New York 1, N. Y.

AULT & WIBORG

DIVISION OF INTERCHEMICAL CORPORATION

Makers of **POLYMERIN**•*—The Original Speed-Bake Finish*

•Reg. U.S. Pat. Off.

economical use of carbon dioxide gas, and the fact that the valve has no sealing disc or other parts to be replaced after use of an extinguisher. The "Squeez-Grip" can be operated while the extinguisher is being carried, making it possible for the user to attack a fire with greater speed and without wasting gas while maneuvering around the fire. The hand carrying the extinguisher operates the valve simply by squeezing or releasing the lever over the carrying handle, "with as little effort as is required for a handshake," while the other hand is free to direct the discharge horn.

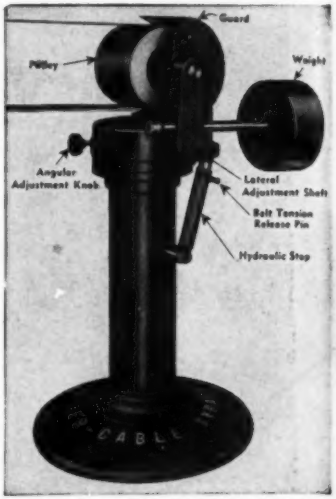
Hand Protection For Finishers

Neo-Film is applied before work. It's new—a liquid (not a cream) and the worker can see with his own eyes how this "visible glove" protects him. It dries quickly and the workers go to their stations, confident that their hands and arms are properly protected. At the end of the work period, Neo-Film washes off easily with soap and water, carrying off all harmful residues, leaving the hands soft and clean. Finishers can use it to good advantage. Neo-Film is a product of Jones Medical Laboratories, Inc., 800 Huron Road, Cleveland, Ohio.

For Grinding and Smoothing Metal Surfaces

As a new addition to its line of abrasive belt grinders, the Porter-Cable Machine Co., Syracuse 8, N. Y., announces a new Model ABS Backstand Idler. This idler is used to adapt grinding and polishing lathes (jacks) to abrasive belt grinding.

Heretofore, it has been necessary to coat the grinding and polishing wheels with the abrasive or use a solid "stone" wheel. The Backstand Idler makes possible the use of an endless metal cutting abrasive belt, which is faster cutting. Heat is greatly reduced because of the long abrasive belt used. This lower temperature operation greatly decreases such hazards as heat, discoloration, warping, fracturing, etc.



Belts up to 6-in. wide can be used.

Where it has been customary to grind, rough polish and finish on regular wheels, the same results are obtained by the abrasive belt method, but the rough polishing operation can be eliminated. All of these factors have a tendency to lower grinding and polishing costs.

Latex Industrial Gloves

Seiberling Latex Products Co., Akron, Ohio, announces that its All-Neoprene Latex steam-cured industrial gloves are impermeable to practically all acids and caustics, and are highly resistant to oils and greases. The long gauntlet style of 14-in. length protects arms as well as hands. The gauntlet end is rolled edge finished. Gauge is medium weight .030 to .040. Black color, smooth surface. All sizes, 10, 11, 11½ and 12 are individually boxed. Available now for immediate delivery.

You can speed up production with

Guardsman AIRPLANE FABRICS

More planes in the air . . . faster . . . GUARDSMAN Airplane Fabrics are a proven way to cut production time, labor, costs. Their use eliminates all sanding . . . saves from 1 to 3 applications of dope.

What GUARDSMAN FINISHES and advanced methods are doing for others — they can do for you.

Exclusive Product of

GRAND RAPIDS
VARNISH CORPORATION
GRAND RAPIDS · MICHIGAN

Continuously supplying finishes to Wright Field since 1935.

Questions and Answers

What "Zein" Is

We have just read about a new shellac substitute by the name of "Zein." We may not have the name exactly right, but the article was carried by our local newspaper. Have you any data as to this particular product and where it is obtainable?—R. C. Co. (Store Equipment).

"Zein" is an alcohol-soluble protein obtained as a by-product of cornstarch manufacture.

"Zein" has been under WPB allocation for the past six months, during which time its production has been more than doubled. WPB announced recently that further increases are anticipated soon.

Many of the substitute shellacs on the market today are making use of "Zein." No manufacturer can claim it as his exclusive property.—*National Paint, Varnish and Lacquer Association.*

Synthetic White Primer for Magnetic Inspection

We would appreciate receiving information as to where we might purchase the synthetic white primer coat which replaces cadmium plating to supply light-colored background needed for magnetic inspection of steel parts for aircraft, to find out if any hidden flaws are in the metal. This was featured in Mr. G. C. Close's article in the Sept. issue of this magazine, beginning on page 37.—G. B. Corp.

This material is made and supplied by a very large concern that advertises regularly in this magazine. (The Editor is giving you the name by letter.) It is a high-solids white primer-surfacer, thinned with toluene substitute thinner (Spec. AN-T-8b, Am. 1, procurement optional).

Instructions for use of the process are as follows:

Preparation of surface: Surface shall be grit-blasted and immediately coated wtih indicator coating.

Preparation of material (thinning): Ratio for thinning material shall be—

Primer surfacer	(parts) 1
Thinner	(parts) 4

Material shall be thoroughly agitated and strained through cheesecloth after mixing.

Application of Coating:

1) Immediately prior to application of coating, the surface shall be blown free of dust with compressed air.

2) Apply one very light spray coat, depositing just enough material to obtain a wet film. Avoid retraction. Finished item presents a very transparent uniform film over the surface.

3) Material shall be supplied for spraying from a well agitated pressure pot.

Maintain 8-lbs. air pressure on fluid in pressure pot.

Maintain 30-lbs. air pressure on air line.

Another HOME FRONT FIRST by Lowe Brothers

One not entirely unexpected result of the construction of huge new war plants in many areas outside the city limits was a shortage of available transportation.

To remedy this situation the ODT authorized the construction of busses in accordance with approved specifications. Lowe Brothers was on the job, and first to supply an acceptable finish of approved color-specifications for these busses which today are providing adequate transportation for war-vital workers.

Lowe Brothers broad experience with U. S. government specifications is serving our war effort in many ways. And Lowe Brothers wide experience in solving industrial finishing problems is serving on the home front as well as the military front. So, whatever your finishing problems, you can depend on Lowe Brothers to have the up-to-the-minute answer to it.

INDUSTRIAL SALES
THE LOWE BROTHERS CO.
DAYTON, OHIO

Lowe Brothers
WARTIME FINISHES for Industry
IN ACCORDANCE WITH U. S. GOVERNMENT SPECIFICATION

Operate spray gun at approximately 8-in. from surface.

Coating shall air dry not less than one hour before being subjected to inspection fluid.

Material shall not be mixed ahead for more than four days requirements.—G. C. CLOSE.

Humidity in Varnish Drykiln

We would like some information in regard to operating force dryers. Our dryers are the type shown on page 49 of your October issue. With a dry bulb reading of 140° F., what reading should we have on the wet bulb to properly dry synthetic varnish and sealer in three hours?

We think there are too many circumstantial factors for any given schedule of time and temperatures, but we would like to have some suggestions.—I. H. MFG. CO.

As you probably know, the object of adding humidity to a wood finish dryer is to prevent removing moisture from the wood, thus eliminating the many attendant evils which always occur; and also to prevent "skin-drying" of the finish.

We have made it a practice of almost equaling the moisture content of the wood by weight, with the moisture content of the dryer atmosphere. On page 20 of the Kiln Drying Handbook, U. S. Department of Agriculture Bulletin, No. 1136, there is shown a comparison chart. From this chart you will see that a moisture content of 6% in the wood equals a moisture content of 40% at 140° F. dry bulb. We would recommend that the moisture content of the dryer be held at 38%.

This would mean a difference of about 30° between the dry bulb and the wet bulb reading. In other words, with your dry bulb reading 140° F., the wet bulb should read 110° F.

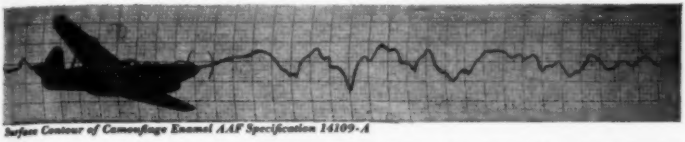
The drying time of three hours is excessive for most production finishes of this type; however, you may be running some special jobs at the present time.—*George Koch Sons, Inc.*

Purchasing Agent Looks at Finishing Salesmen

GOD and our industrial leaders have, for some as yet unknown reason, selected the finishing supplies and material salesmen —and in so selecting, chose the best, so it is extremely hard to kick one out; just as hard to tell him, "No," and once in, twice as hard to lose him. Not that there's

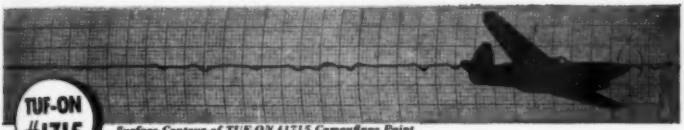
anything wrong with a lumber or hardware salesman but those finishing "guys" are born with the zip and personality that is bound to win them friends, whether they sell or not, and that includes a record of the same salesman calling continually for ten years before he sold his first order.

There is no doubt in my mind that most P.As. are cranks, albeit



Surface Contour of Camouflage Enamel AAF Specification 14109-A

Surface Contour of Camouflage Lacquer AAF Specification 14105



Surface Contour of TUF-ON #1715 Camouflage Paint

INCREASING AIRCRAFT SPEED with SMOOTHER CAMOUFLAGE PAINT

The demand for faster and faster combat planes has focussed attention upon the relationship of smoothness of aircraft finishes to flying speeds. The Wipe-On Corporation has developed a special smooth camouflage paint (Tuf-On #1715) to meet these requirements. It produces an extra smooth, non-specular finish that reduces air friction to a minimum. The greater smoothness of the surface is clearly shown in the lower graph reproduced above.* TUF-ON #1715 Camouflage Paint is available in all required colors. Write for further data.

*All graphs shown made by impartial analysts on a special type of equipment which measures surface smoothness in millionths of an inch. Name and details upon request.

TUF-ON
AIRCRAFT FINISHES

INDUSTRIAL RESEARCH DIV. OF WIPE-ON CORP., 105 HUDSON ST., N. Y. C.

friendly ones, and it takes quite a lot of pumping to get the slightest rise out of them, and perhaps justly so, because if the doors were wide open most firms would soon become testing laboratories.

For a more concise viewpoint, let us proceed from the opening door.

Practically all salesmen come with an outstretched hand. Now back in Good Old St. Richard's time, this perhaps was quite all right, but I for one shy at shaking hands with a stranger I never met, even though he comes bearing tidings from his firm. After all in a buyer's market, who's interested in a product when the one you're using suffices. So, you find yourself being pumped and squeezed by a smiling personable fellow who then proceeds tying you up with usually a 5-minute prologue.

When you have caught your breath, you find yourself answering questions about heat control, drying time, sanding and the like. After your statements have been gravely noted by our friend salesman, who in the interim has been looking over your shoulder and admiring your secretary, he suddenly springs the order blank and wants a small order of five drums to start off with, and you can be assured that his merchandise has the most mileage, the best sanding, the fastest drying and the lowest gun cost of any material you have used, including the one that the present salesman sells you after it took him three years to get the order. Then your dander gets up. You ask for samples. Samples cost money. So what! So you'll get your sample and see you in two weeks.

Now, samples cannot usually be tried at once and what can you do with one gallon of material. So every week you get a call for about two months. Then in sheer exasperation you try the sample. Bah! Lousy. On the next call the salesman is informed and in he starts all over again. Usually another sample is left. In this way five or six samples are tried over a year's period. Just when he finally brings some stuff around that begins to look good, he loses interest and doesn't show his face until a few years have elapsed or he needs some new clients.

And friends, that tale just mentioned is one the P.As. have to go through time and time again. If all the promises that salesmen gave would turn true, a million dollars of furniture could be finished at a cost of $10,000, which of course is ridiculous.

Just what is the answer to this dilemma. Usually the P.A. will harden and refuse to see selesmen. Often he'll brush them off. Now, I believe (and each man is entitled to his own beliefs) that a few simple rules could benefit all:

1) Observe calling hours.

2) Don't get too friendly at the beginning.

3) Never proffer lunch until you have sold.

4) Don't knock other products.

5) If you cannot keep a promise, don't give one.

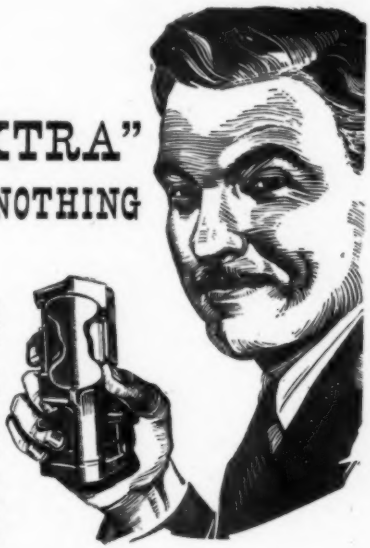
6) Wait for tests on samples. Don't be pesty.

7) If you cannot sell, leave as a friend. After all, you can't get them all.

Perhaps you feel that I am an old grouchy P.A., but don't get me wrong. I love my job and you fellows are part of it.—J. HALPERIN.

In four New Jersey foundries of one company, the monthly production of magnesium castings averages nearly 400,000-lbs.

HERE'S A PAINT "EXTRA" THAT COSTS YOU NOTHING EXTRA!



Complete industrial paint service means more than just paint. It means the practical "know how" that stops production trouble before it becomes serious. ¶ Here's an example: A customer was finishing magnesium forgings. A prefinish was being applied that prevented proper paint adhesion. Instead of being dichromated, the forgings were chrome pickled. As a consequence, the paint film was brittle, due to poor adhesion. ¶ Telephone contact with the forging manufacturer quickly uncovered the trouble and got production going again. ¶ Further study resulted in still another production improvement... still greater adhesion and film toughness through a better balanced drying schedule. ¶ The finishing of new light metal alloys brings up new finishing problems, in the solution of which we will be glad to give you the benefit of our experience. There are many such "extras" in Berry Brothers' Industrial Paint Service which cost you nothing extra. May we tell you more about them?

BERRY BROTHERS, Inc.

Quality Finishes Since 1858

INDUSTRIAL VARNISHES • ENAMELS • LACQUERS

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JERSEY CITY • BOSTON • CINCINNATI • CHICAGO • ST. LOUIS

Testing Flexibility of Coatings

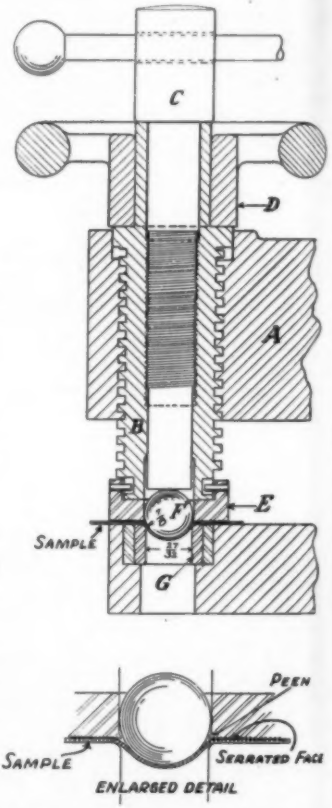
FROM time to time chemists, engineers and others find it desirable—in fact practically necessary—to test the flexibility and adhesion of certain protective and decorative coatings to be used on sheet metal parts or products. Many items made of thin sheet metal are coated and decorated or printed while they are in flat sheets. Later they are cut and formed, the latter operation involving more or less severe bending or drawing. The coating must not crack, loosen, peel or flake off when this forming operation takes place. Tests applied to these coatings frequently consist of the drawing or cupping test.

A simple fixture for subjecting a coated sample of sheet metal to the "cupping" test is illustrated in the accompanying drawing. The fixture consists of a commercial steel screw punch which has been reworked to provide a double action screw motion.

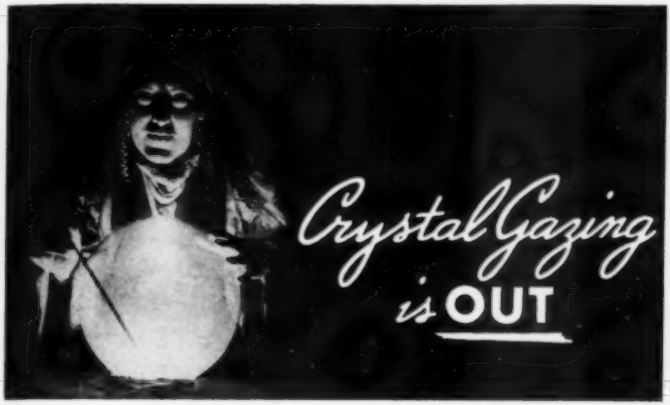
The punch and dies have been removed from the screw *B* and body *A* respectively. Screw *B* has been drilled and threaded to receive a new inner screw *C*.

The ball housing *E* is made to fit a hardened steel ball *F*. This housing has two pins protruding inward into a reworked groove of screw *B*, so as to allow the screw to turn while the serrated face of the ball-housing is clamping the sample of coated sheet metal. The inner edge of the hole in the ball housing. at the bottom, is slightly peened to keep the ball in its housing when the screw *C* is raised or drawn back.

You start operation of the device by having both screws in "up" position, high enough to allow the sample to be placed in position, coated side down and clear of the steel ball. The larger screw *B* is first screwed down to clamp the sample in position. This screw *(B)* is turned by handwheel *D* which fits over its squared shank, located just below the top of screw *C*. Then screw *C* is brought down to press the ball against the sample



Details of testing device for cupping samples of coated sheet metal.



No doubt a good experienced crystal gazer can see a lot of interesting things in his crystal ball. But one thing he would never find if he gazed a thousand years is the correct formula for a Government finish. That's a matter of laboratory research and sound technical judgment. We have employed both in our search for formulas which meet exacting Government specifications for war finishes. We have the answer to your finishing problem whatever it is. Phone us at our expense: Pittsburgh, CEdar 8100. Our laboratory is at your service.

WATSON-STANDARD CO.

Manufacturers of
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FINISHES AND LITHOGRAPH COATINGS

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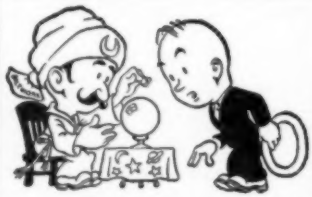
TOUGH JOB HEADQUARTERS
℞ Prescription Finishes
Give us your metal coating problem. We guarantee you an answer based on your conditions, and not just a standardized formula.

of coated sheet metal. Pressure is continued until the ball and coated sample of sheet metal will go no farther, because they are stopped by pressure against the inner shoulder of the cylinder metal sleeve *G*, see enlarged sketch. This causes the steel ball to "cup" the sample—and every other sample that is tested will be cupped identically the same, which serves as a basis of comparison when judging the adhesion, flexibility, etc., of different samples of coating material.

While this equipment can be used in vertical position, as shown in the accompanying drawing, it is obvious that if it were mounted horizontally you could see the cupping of the coated surface better as pressure is applied, and take note of signs of failure when they begin—in case failure of any tested films of coating material does occur.—P. E. VERAA.



"WHAT'S AHEAD"

see the

January, 1944, Issue

Editorial contents will feature lengthy opinions, comments and suggestions on "What's Ahead" by authorities in the product cleaning and painting branches of industry. DON'T MISS IT!

Booklets Catalogs Circulars

Product Design Service

Manufacturers interested in the development of new products or redesign of their regular products will find valuable help in the illustrated brochure—"12 Questions and Answers on D. F. I. Planned Products Service," just off the press.

Describing the facilities of Designers For Industry, Inc., a design engineering organization which has served 300 industries since its establishment in 1935, this brochure gives the experience of key personnel and shows pictures of some of the work done. Complete information on this service is contained in the answers given to the question.

A copy of this brochure may be obtained without obligation by writing to Designers For Industry, Inc., 2915 Detroit Ave., Cleveland 13, Ohio.

Dust—Saboteur of Production

The menace of industrial dust and an economical efficient method of controlling and removing dust at its source is described in a new 8-page Dustube Dust Collector Bulletin entitled, "Dust—The Silent Saboteur of Production," recently published by American Foundry Equipment Co., 555 S. Byrkit St., Mishawaka, Ind.

Resin-Emulsion Paints

"'Ti-Pure' R Rutile Titanium Dioxide in Resin Emulsion Paints" is the title of a 16-page booklet being made available to paint manufacturers by the Pigments Department of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

The booklet is the result of laboratory investigations on the relationships in hiding power and brightness which

VICTORY WRINKLE FINISHES

Developed by M&W without CHINAWOOD OIL

TO conform with government regulations prohibiting the use of chinawood oil in the manufacture of standard wrinkle finishes, our laboratory has developed a complete line of wrinkle finishes without this critical material.

Victory Wrinkle Finish gives a uniform wrinkle of the desired pattern in a single coat using ordinary methods of application. Its characteristics are similar to those of our well-known Duart Wrinkle Finish, providing a tough, durable coating which readily covers surface imperfections. It is supplied in a full range of colors. Write for full details.

★ ★ [*Formula for a Quick "Finish"* **BUY MORE WAR BONDS**] ★ ★

MAAS & WALDSTEIN COMPANY, NEWARK, N. J.

PRODUCERS OF LACQUERS, ENAMELS, SYNTHETICS AND SPECIALTY FINISHES FOR ALL PURPOSES

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exist between rutile and anatase titanium pigments and their relative economy in resin emulsion paints.

Ten full-page charts show rutile vs. anatase Titanium dioxide with respect to brightness; dry and wet hiding, both with and without lithopone; saving through replacement of anatase by rutile; and the merits of water-dispersive rutile and anatase in comparison with normal grades of these pigments.

Six pages of discussion and interpretation precede the charts in this booklet which is a timely contribution in view of the present limited availability of vehicles for oil paints and the considerable attention being gained by the resin emulsion finishes. Requests should refer to booklet A-3860, "'Ti-Pure' R Rutile Titanium Dioxide in Resin Emulsion Paints."

Magic Illusions With Color

Eagle Printing Ink Co., Division of General Printing Ink Corp., 100 Sixth Ave., New York 13, N. Y., has issued the 13th folder in its Color Fact Series. This latest folder, titled More Illusions and Magic With Color, contains several interesting demonstrations of visual phenomena.

Although many of these demonstrations have an entertaining value it is highly probable that the basic thought can be applied to furthering the use of color in various ways. Copies of this amusing folder are available upon written request.

Eyes Toward Future

"Win the War . . . . but Plan for Peace," is the title of a 12-page illustrated brochure published by The Fostoria Pressed Steel Corp., Fostoria, Ohio. It not only touches on the above subject, but illustrates how near infrared equipment has fit itself so admirably into diversified peace and wartime operations. It is reasonable to assume that more of industry will be in need of the experiences of others, as Fostoria has presented them. Copies of the brochure are free.

Catalog of Finishers' Supplies

James H. Rhodes & Co. announces a new publication featuring its composite and inter-related line of industrial finishing mediums. This catalog features eight different finishing products which include:

Felt Wheels & Bobs used in finishing and polishing of metal parts.

Steelwool produced in shapes and forms for general maintenance, filters and special uses.

Powdered and Lump Pumice, a soft abrasive ideal for polishing copper plates, wood, and plastic parts.

Abrasives & Rouges, materials used for grinding, polishing, buffing and lapping of metals, glass and minerals.

Sponges & Chamois, both of which have many industrail applications in addition to general clean-up purposes.

Copies may be obtained without cost by writing to the James H. Rhodes & Co., 157 W. Hubbard St., Chicago 10, Ill.

Temperature Control Bulletin

Sarco Co., Inc., 475 Fifth Ave., New York 17, N. Y., announces a 12-page bulletin No. 700 on Sarco cooling controls, self-operated temperature regulators and mixing valves, to control cooling circuits on internal combustion engines, compressors, condensers, degreasers, stills, etc. The bulletin is completely illustrated, shows diagrams of many typical hook-ups; also capacity tables, prices, etc.

Free Book; Synthetic Resins

A technical booklet reporting on the use of Lewisol maleates in protective coatings has just been issued by the Synthetics Department of Hercules Powder Co., Wilmington, Del. Copies of the booklet may be obtained upon request.

The Lewisols are described as hard resins, made by modifying rosin esters with maleic alkyd compounds, in common with other hard resins of the rosin ester group. They are primarily intended for compounding with film-forming materials such as the cellulose derivatives, or with drying oils to achieve gloss and hardness, and in most cases to improve adhesion.

Safeguarding Women Workers

The advent of women in plants and factories, performing jobs with ever-present physical hazards, has brought to the fore the problem of educating women workers in safe working methods. To assist the industrial executive in formulating a safety program designed to make the woman employe safety-conscious, the Policyholders Service Bureau of the Metropolitan Life Insurance Co. recently issued a report entitled, "Safeguarding the Woman Employe."

According to the findings of this study, successful safety training begins at hiring. At that time, many industrial employment supervisors outline the company's rigid safety rules. In some cases, the female applicants for employment are required to attend a short orientation course, during which an experienced safety super-

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Industrial Finishes

that make the most of available raw materials to give you greatest durability, together with attractive appearance and economy.

• FOR APPLICATION BY ALL METHODS

JAMES B. DAY & CO., CHICAGO

visor points out to them the nature of their jobs and the hazards attached to them. Through talking-moving pictures, showing machines at work, the safety and health hazards are pointed out. Personal tours of the plant are conducted, demonstrating the points brought out in the orientation course.

As in any other safety program, it is necessary to keep the idea of safety before the women workers. The report lists such media as company broadcasts, posters, scoreboards, movies, meetings, employe magazine articles, illustrations, and exhibits for keeping the safety idea prominent.

Copies of this study are available to executives who address the Bureau on their business stationery. Address: Policyholders Service Bureau, Metropolitan Life Insurance Co., 1 Madison Ave., New York 10, N. Y.

To Prevent Welding and Cutting Fires

To instruct users of welding and cutting equipment in reducing potential fire losses, the International Acetylene Association has prepared a convenient, 16-page, pocket-size booklet entitled "Preventing Welding and Cutting Fires." This booklet, written in easy-to-understand style, contains brief, clear discussions of the chief causes of fires and practical, commonsense measures for preventing them. A copy of this booklet may be obtained in reasonable quantities without charge directly from the International Acetylene Association, 30 East 42nd St., New York 17, N. Y.

Electronics in Industry Described in RCA Book

A clear-cut exposition of the practical part electronics are playing in various industrial fields, as differentiated from the fanciful, "blue-sky" imaginings of some current writers, is graphically presented in a 44-page booklet just released by the RCA Victor Division of Radio Corporation of America, Camden, N. J. Profusely illustrated in color, and written in nontechnical language, this booklet, "Electronics in Industry," is being made available to business executives, manufacturers, and industrialists in whose fields the science of electronics may find applications.

The plainly worded text and four-color illustrations dispel the mystery often associated with electronics by showing the workings of practical electronic devices now in operation in numerous fields of industry, government, education, and entertainment.

RCA electronic devices are shown improving products, making new products possible, eliminating safety hazards, and saving time, space, manpower, and costs in such familiar industrial operations as molding, soldering, localized hardening of metals, paint baking, riveting, gluing, wooden veneers, and seaming fabrics.

Metal Cleaning Booklet

A revised edition of "The American Line," a 20-page reference catalog of the entire line of products manufactured by the American Foundry Equipment Co., 555 S. Byrkit St., Mishawaka, Ind., has been released. This profusely illustrated catalog presents a complete summary of Wheelabrator airless blast cleaning equipment (Tumblasts, Tablasts and Special Cabinets); metal-washing machines, Dustube cloth-bag type dust collectors; sandblast equipment, etc.

An interesting section is devoted to a brief description of the mechanics, applications and advantages of the airless Wheelabrator method of abrasive blast cleaning.

Free Book on De-Scaling

Designed to meet the demand for practical information on methods for quickly and safely ridding water-cooled and water-circulating equipment of insulating lime-scale and rust deposits, a new 28-page Oakite De-Scaling Manual, revised and enlarged, is now available to works managers, plant superintendents, mechanical supervisors and other executives responsible for wartime maintenance.

The manual contains 28 pages of concise practical data that is now being successfully used to step-up output of existing equipment, shorten shut-down time and conserve manpower in cleaning and de-scaling varied types of equipment common in industry.

In connection with this work, it is stated that an acid-type scale-dissolving material, known as Oakite Compound No. 32, eliminates the hazards to personnel and equipment so frequently involved in the use of commercial raw acids and avoids the need of tedious time-consuming mechanical methods on a wide range of scale and rust removal work.

Of special interest to production executives is the information presented in the manual on how Oakite Compound No. 32 is being widely used to remove mill scale and other scale deposits from heat treated, hardened, annealed or welded war supply items before subsequent finishing operations and to rid parts of rust between manufacturing or assembly operations. Copies of this specially prepared, illustrated manual are available on request. Write to Oakite Products, 32F Thames St., New York 6, N. Y.

Clinco

PROTECTIVE COATINGS

will continue to serve manufacturers of implements of war until Victory is won—enabling them to meet rigid Government requirements in coating their products!

Meanwhile,

post-war requirements are being considered, looking to outstanding CLINCO values in peace time. *Inquiries welcome!*

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Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metal-working, woodworking and miscellaneous industrial plants where production cleaning and finishing are major operations in parts and products manufacture.

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Editorial

Postwar Planning; Value of Research

Postwar planning which promises a 25% increase over prewar levels in Delaware employment after the war was suggested as an answer to the postwar problems of the United States by P. W. Meyeringh, vice-president of Hercules Powder Co., in an address Nov. 15 before the American Institute of Chemical Engineers' annual meeting at the William Penn Hotel in Pittsburgh.

Declaring that we can carry on the war effectively and also make plans for the postwar period, Mr. Meyeringh said that we would be giving up all that we are fighting for if we failed to provide for employment after the war.

"Now is the time to take stock and do whatever we can to neutralize the aftermath of the war in its effect on business and employment," he said.

Mr. Meyeringh, who is Delaware chairman of the Committee for Economic Development, said the national committee was set up a year ago by business men who felt the necessity of a nation-wide movement to bring about a high level of employment after the war.

It is absolutely necessary to enlist the efforts of medium-sized and smaller industries to achieve this end, he said.

The Delaware estimate of postwar employment was developed through discussions with a large number of manufacturers in the state.

He cited the chemical industry as a natural leader in industrial planning. The industry is not afraid of new developments, changes in approach, methods or thinking.

Discussing scientific research for business, Mr. Meyeringh said Hercules Powder Co. feels that a research program can be put upon a profit and loss basis which will show definitely its value to a company.

"We have been trying to look upon research as an industry and, as such, are within reason, subjecting it to the same tests to which

SUPERIORITY *in the air!*

A pre-requisite to Victory made possible by American ingenuity and production genius.

Walker's protective coatings have made a notable contribution to our mounting war materiel production by helping to solve many war production finishing problems. Walker's staff is justly proud of their war research and production achievements.

Alert manufacturers "Call on Walker" to help them solve their present and post-war production finishing problems.

for

PRIMERS
SURFACERS
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"Call on Walker"

H. V. WALKER CO.

Elizabeth, New Jersey

MODERN PRODUCTION FINISHES

★ ★ ★ **INDUSTRIAL FINISHING wishes all of its friends a Merry Christmas and a very Happy Victorious New Year.**

we would subject an operating department, or for that matter the company as a whole.

"Research is an industry. Its raw materials are ideas and its finished product appears on the market through the activities of the operating department after the ideas have been molded into marketable products.

"Then why not work out a 'profit and loss account,' showing on the one hand research expenditures, and on the other hand 1) the new products developed during that year, their potential markets, and therefore their potential profits, and 2) new products that were developed during the last five years, their growth and their actual profits during that period of five years."

Selecting Finishing Materials

★ The most frequent error in judgment, made by users of industrial finishing materials, is to select them merely on the basis of easy working qualities. Many times a material of superior performance characteristics is rejected solely because it presents a little greater difficulty in applying than a competitive material of vastly inferior characteristics.

Conscientious formulators of finishing materials recognize this, and always endeavor to make their materials as easy and convenient to use as possible, consistent with performance demands. However, many times an improvement in working qualities is made at the expense of some important quality factor. The user should beware of this.

A good example is lacquer sealer used on wood furniture. A sealer can be made to sand in 10 or 15 minutes after spraying by loading it up with sanding agents such as zinc stearate. However, such sealers shrink, give very poor adhesion, and make the final finish very brittle and sensitive to marring. There is considerable danger of crawling of top coats. Also, the completed finish will be deficient in gloss and clarity. A longer air-drying time of from one to two hours, or a short force-dry on a conveyor will make it possible to use sealer having a normal amount of sanding agents, with enormous gains in quality.

This is not to minimize the importance of good working properties. Sandpaper is expensive; extra time and effort are costly. But sacrifice of quality to secure extreme ease of working is false economy. There is a middle ground that represents good judgment.

Every finisher, when selecting one of several competitive materials to adopt for regular use,

★ Guest Editorial . . . Many readers can write an excellent editorial — two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

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should take care that his selection represents a well-considered judgment. In particular, he should avoid the error of selecting the "easy" material which may give him and his company trouble later. Balance quality against ease of working, and strike a suitable compromise. After all, every finishing material is a compromise, and is balanced to give what the formulator considers maximum quality consistent with practical working characteristics.—R. H. WAMPLER.

Wood Furniture Industry Carries on at War Tempo

★ The wood-furniture industry has gone "all out" in its contribution toward this nation's war effort. In order to do this, the furniture manufacturing industry has faced and overcome various difficulties. Many problems were solved so thoroughly that there was very little slow-down in production. But since the first hurdles were overcome, several new problems have confronted the industry.

Most serious of the problems facing the wood-furniture manufacturers is the scarcity of skilled help. Thousands of our most proficient and experienced employees have gone to the colors, while thousands of others have gone to war jobs that pay much higher remuneration. It has been no small matter to train new operators to produce acceptable goods at war tempo. Some manufacturers have found it necessary to run two and three shifts, where they formerly ran only one shift. How they have trained so much new help, and at the same time acquired enough

I. C. D. FORMULA NINE
NON-INFLAMMABLE « wax free REMOVER »

for paint, varnish, lacquer, baked enamel, adhesives

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SPECIALTY COATINGS—I. C. D. Labs. have specialized in the formulation and manufacture of non-inflammable coatings and substitute finishes. If you have a tough coating or finishing problem send in your specifications, finishing schedule and requirements. Immediate action and a prompt reply promised.

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131 MADISON AVE. NEW YORK, N. Y.

workers to run additional shifts, speaks well for the foresight and determination of the management.

Furniture manufacturers have been plagued with a serious shortage of raw materials. In plants that are 100% on war goods, we have the problem of keeping enough raw materials coming in to keep production at the peak that the war effort demands. This is especially true of high-grade lumber, veneers, hardware, finishing materials, etc. Machinery parts for repairs and replacements to keep the various machines running at full production has presented a big problem.

In spite of all of these disadvantages and the problems involved in these hurried and rapidly accelerated operations, the wood furniture manufacturers have taken their responsibilities in stride and have made a record of production comparable to that of any industry of like size in America. And, I am sure that this speaks well for the fine co-operation of both management and employees. — H. W. CHESTER.

How to Teach Workers Quickly

With the rehabilitation of millions of persons providing one of the greatest post-war problems, old-style "book learning" must be supplanted by new methods of training through the use of picture instruction books, according to Assen Jordanoff, author and president of the Jordanoff Aviation Corp., New York, N. Y.

Former methods of teaching were satisfactory as long as enough time was available, whereas at the

close of the war, millions of persons will find it necessary to readjust themselves to different types of jobs in the least possible time. Soldiers will be returning to civilian life. Some of them will have former jobs to go back to; others who left school to enter the fight will have to find a place in industry without any previous training to offer. Men and women trained solely to wartime industrial work will have to learn a new technique in peacetime plants as soon as those plants can be established.

When the war ends, industries will have a two-fold task facing them. One is retooling. That may mean using equipment which was laid aside for the duration. The other job is training workers. That can be a difficult or an easy problem to solve. Most industries know now what their post-war activities will be. The next step is to prepare training methods so that the period of instruction will be cut to a minimum when the time comes.

Random Comment on the Industrial Scene

BY LAWRENCE H. SINGER

Better Finishes Coming—In a paper dealing with postwar technical developments in the paint industry, Dr. H. A. Gardner predicts that peacetime industrial finishes will, to a greater extent than ever, approach the durability of the article itself.

"We can't go as far as the manufacturer of a certain pen and pencil," adds the research director of the National Paint, Varnish and Lacquer Association, "and guarantee a paint coat to last forever, or even for the life of the user."

Dr. Gardner believes that alkyd

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Within specification limits there are many possibilities of improvement in speed, workability, and freedom from rejects.

This PLUS factor is worth considering. We'd like to tell you more about it.

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Wyandotte F-100 will help cut your floor-cleaning costs. Even heavy soil disappears when this remarkable compound gets to work!

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More than a Dictionary—an Encyclopedia. This is the most complete work of its kind now available. It includes definitions of trade names of raw materials used in the Paint and Allied industries—also charts, tables, useful information and miscellaneous data to which you can refer often. It describes all the important testing devices and apparatus used in the laboratory, together with illustrations and is strictly technical, thoroughly authentic and completely unbiased.

INDUSTRIAL FINISHING
1142 N. Meridian St., Indianapolis, Ind.

finishes, or blends of alkyd, ethyl cellulose and similar compositions, will again be used on automobiles, and that the trend will be towards fewer coats of greater thickness. Modified cellulose nitrate lacquers will continue to be used, particularly on higher-priced cars. In the furniture field, he contends, low-bake synthetics will compete with lacquer and oleoresinous formulations.

* * *

No Paint On Planes?—A recent order of the Army Air Forces, calling for the removal of the paint film from all planes operated domestically by the Air Transport Command, has started a wide degree of speculation.

According to an Associated Press story from Kansas City, it is possible that all airplanes assigned to permanent service within the continental limits of the United States may soon gleam in their natural aluminum finish. Until recently, only training planes were unpainted.

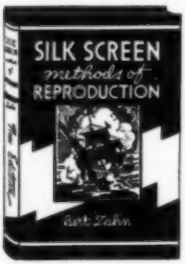
It is pointed out that stripping of the paint film will permit carrying an additional 150-lbs. of cargo in a big transport, and will also increase the ship's speed. The factor of faster depreciation, however, seems to have been overlooked.

* * *

Versatile Wood—Plastics, lubricants, aviation fuels, rubber and explosives—these are a few of the myriad products Germany is now obtaining from her forests, according to Egon Glesinger, secretary general of the International Forest Products Committee.

We have learned how to produce alcohol, sugar, rubber, fabrics and plastics from wood ourselves, he adds. And Mr. Glesinger contends that fears of a prospective shortage of lumber are groundless. America's forests still cover one-

SILK SCREEN METHODS of REPRODUCTIONS



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Every detail of the silk screen process is presented clearly in detail. All equipment is fully described and its use illustrated. All materials needed in the various kinds of silk screen work are mentioned with respect to their use to advantage. Estimates of costs and prices to charge are given.

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1142 North Meridian Street Indianapolis, Ind.

fourth of our land surface, and North America's woodlands are twice the size of Europe's, he adds.

* * *

New Uses for Magnesium—Postwar radios will probably be the first consumer goods to utilize large quantities of magnesium. Since compactness and lightness have been prime considerations in the development of wartime communications equipment, an enormous store of "know-how" is being accumulated in the fabrication of of radios made of this light metal.

Magnesium is currently quoted around 20 cents a pound, compared with $5.00 a pound in 1915. Among the other peacetime applications envisioned for this material are in home appliances, portable tools, and transportation equipment. Production, which was a mere 3500 tons in 1939, is now passing 250,000 tons annually.

We'll Wait For Tung Oil—Many people mistakenly believe that huge quantities of China wood oil will be available for paint finishes as soon as the war in the Pacific is concluded, says Dr. Maximilian Toch, but this is a sad case of wishful thinking.

Pointing out that tung oil tree production was restricted to an area of about 1600 square miles, Dr. Toch, who is past president of the American Institute of Chemists and an honorary professor of industrial chemistry at the University of Pekin, adds that much of this land has been a bloody battleground in recent years.

Many of the trees have been destroyed in the carnage, he reminds us, and others have been used as fuel. China wood oil has almost completely disappeared from the paint market, apart from a small amount being grown domestically.

Speeds Production for Coating **WAR PRODUCTS**

500 Large Cartridge Clips Coated Per Minute 1000 1" Buckles Coated Per Minute with R-200

"SPEEDIP" Whirl Enameler and Coating Machine

A combination dipping-whirling machine for completely coating large quantities of small parts with lacquer, enamel, paint, oil, wax, etc. ● All operations are within the machine. Parts are dipped into coating material, raised and whirled. Time—as little as 30 seconds. Speeds up production—cuts finishing costs—saves up to 90% of coating materials.

WRITE FOR FURTHER DETAILS OR SEND SAMPLES TO BE COATED.

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45 River Ave., Providence, R. I.

Making Progress—In a recent review of technical advances in railroad equipment, "Business Week" adds this laconic comment: "At this stage of the game, it is hard to tell the difference between postwar planning and ordinary worrying. When it comes to worrying on a systematic basis, however, the railroads have made some progress."

* * *

Planning Ahead—"The war has given manufacturers intensified training in low-cost production," writes Harry W. Alexander, New York industrial consultant, in "Postwar Headlines." He adds that the great factor will then be ingenuity displayed in getting the product to the user with the least additional cost beyond the production line. "Each individual business," Mr. Alexander asserts, "then must plan not only for full production, but for productivity plus earning power."

* * *

Presenting Indium—Doubtless you have been hearing about this soft silvery metal, which is doing numerous miraculous war jobs. Extracted as a by-product of the smelting of certain zinc ores, it is currently selling for $10.00 a troy ounce.

Indium was first used in dental alloys, but now is being widely adopted for many industrial purposes. Indium added to gold increases strength and ductility, checks discoloration.

When combined with copper, a trifling quantity of Indium causes a great increase in hardness. And a small amount added to silver

makes it tarnish-proof. Postwar possibilities for this unique metal seem endless.

* * *

War Production Cut—The end of the German phase of the war will probably lead to an overall halving of our war production schedules, in the considered judgment of many qualified observers. Aircraft and ships will be the major needs for the Japanese campaign, of course, along with the accessory equipment required for those operations. Supplies for army ground forces will likely be the first to receive major slashes.

* * *

Outlook For Planes—The eventual fate of our huge aircraft industry, following the defeat of Japan, continues to be a big question mark. It is doubted whether more than five or ten percent of our present productive capacity will be required for the immediate postwar years.

Aviation companies may thus be expected to attempt ventures into many new fields — prefabricated housing, helicopters, even furniture manufacturing.

* * *

Ten Years Into Two—Union Carbide and Carbon Corp. has recently told the story of Buna-S synthetic rubber in a highly interesting pamphlet. The company points out that ten years are generally required to take a process developed in a laboratory, put that process to test in a pilot plant, iron out production kinks, design a full-scale plant, and then actually build the plant and go into full production.

By working at top speed, however, Carbide and Carbon telescoped this work into 20 months' time. This accomplishment ranks as one of the major industrial achievements of our time.

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5 Gallon BLUE BOY Model

PAINT REJUVENATOR

Restores Paints, Lacquers, Enamel Products and Pigment Primers, to original consistency in 3 to 10 minutes without opening the can. Available for Round or Square 5-gallon cans. Explosion-proof electrical equipment if desired. Also other units from ¼-pint to 50-gallon drum capacity available. Originators of Paint Rejuvenating equipment — ten years—thousands of satisfied users.

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This **NEW** Crown gun gives high efficiency and speed in production work and maintenance and other painting and finishing jobs . . Uses time-tested Crown "20" Spray Head assemblies . . Full Spray Width, Material Adjustment . . Write for literature and prices.

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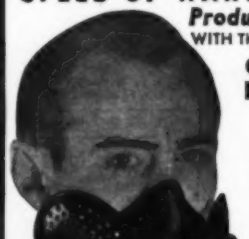

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Chicago Eye Shield Co.
2347 Warren Blvd. Chicago, Ill.

Research For Tomorrow — Consolidated Vultee's attractive and readable house organ, "Plane Talk," carries a report on findings brought to light in the company's test chambers. The hydraulic fluid generally used in planes freezes at 50° below zero, while gasoline freezes at 90° below. Rubber becomes as brittle as glass at these low temperatures, which are encountered in sub-stratosphere flying.

* * *

Secret Weapon — General Electric's "Story of the Turbine" tells why American warships can go farther and hit harder than their adversaries. It is because our vessels consume as much as 35% less fuel than the ships of other navies.

Almost unheard-of tolerances have become routine in turbine construction. A large gear may be more than 11-ft. in diameter, may weigh as much as 75,000-lbs.—and yet it must be accurately machined to one 10,000th of an inch.

* * *

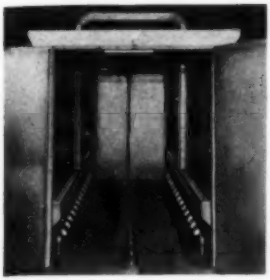
Plastics At War—Experience gained in molding lightweight extra gas tanks for our planes will help in speeding many postwar developments, we read in "Durez Plastic News." Go-Ro-Lite plastic can be handled on a production basis by low-pressure molding; extraordinarily large pieces can be produced by this method; and the impact strength is high.

* * *

Car Of The Future—The rear-mounted engine will probably be the outstanding development in the postwar car, according to Bill Stout, famed automotive and aircraft designer. It will weight less than 3-lbs. per horsepower, and will deliver 25 to 45 miles to the gallon of gas.

As to exterior design, Stout con-

PRODUCTION *Tripled* and GAS COST *reduced 14¢ per hour*



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"Our tests, which we ran before and after installation of Burdett "Infra-Red Principle" Gas Burners, have proven that we are saving 14c an hour on our gas bill and have reduced our baking time from 2 hours to 40 minutes per batch"—writes another user. Investigate what this revolutionary principle of heating can do for you. Write for new Bulletin giving complete information.

Burdett Burners have been proved in every heating application.

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BURDETT MANUFACTURING CO.
Infra-Red Gas Burners

tends that the automobile of the future will more nearly resemble the sleek bus than the airplane. The weight should be only about half that of 1942 models, use of the light metals and re-handling of old materials making this reduction possible. He does not believe transparent plastics are as yet sufficiently tough for windshields and windows — they scratch too readily.

* * *

Radio Tickets—Camel Cigarettes and Cities Service Co. are among the sponsors now co-operating in furnishing broadcast tickets to our readers. When wishing free tickets to leading programs, write to:

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130 West 86 Street
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Paint Salesmen . . . Of the Future

The paint salesman who starts out after the war with a briefcase and an empty head will soon be left far behind by the salesman who is armed with not only a briefcase but a thorough knowledge of the post-war situation in general. This knowledge can be gained in only one way—through study and thought.

It is generally concluded that wartime expansion will be carried over into a great many post-war fields. Aviation, for instance, is tremendously larger than it was in pre-war days, and our peacetime skies will see thousands of planes where dozens flew before. Railroads will be building new rolling stock and repairing war-

worn equipment; and trucks, buses, and private cars will again crowd our highways.

Customers of tomorrow will be more discriminating. War standards are rigid, and customers will continue to expect the best. Also, competition will be keen and a product, to survive, will have to be good. . . . *Excerpts from an address by H. A. Tallon (President of the National Paint Salesmen's Assn.) delivered at the 1943 Convention of the National Paint, Varnish & Lacquer Association, Inc.*

Rags soaked with linseed oil and other drying oils often present a serious fire risk. Oxidation of the oils may raise the temperature of the dirty rags to the ignition temperature, with the result that a fire occurs.

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We prefer a man who has had several years experience on industrial paint and lacquer problems.

It is a position which offers for the right man a good opportunity to grow with our organization. Won't you give us enough information about your training and experience to warrant an early interview.

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Dirty or misblended solvents. Will purchase or reclaim your materials. Write for details giving quantity and approximate composition. M-K-W RESEARCH LABORATORIES, Station D, Box 8, Dayton 10, Ohio.

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In excellent condition. All or part. No priorities required. $.75 per gallon. RAND CHEMIAL PRODUCTS CO., 2335 So. Mich. Ave., Chicago 16. Phone, CALumet 2866-67.

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Continuous gas fired baking oven for force drying paint. 11'6" wide, 48'6" long, 12' high with floor space 6'8" high under half of oven. Self dipping arrangement. Has been operating at 275° F. Priced at $1,500 for quick sale. Price includes all burners, motors, driving gears, and controls. Purchaser to remove from our factory.

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MAKES STERLING SANDING BETTER THAN HAND OR ORDINARY MACHINE SANDING!
By quickly moving 4 pencils in continuous circles you have illustrated the principles of orbital motion!

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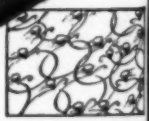
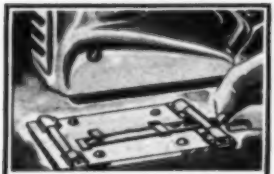
Here's a new sanding machine that assures results far exceeding hand or ordinary machine sanding in both quality and speed! Quickly producing extra-smooth surfaces on wood*, metal, plastics or composition, the Sterling 1000 Electric Portable Sander operates with exceptional precision and holds to extremely close tolerances without gouging or marring.



At a speed of 4500 oscillations per minute the sanding pad moves grains of sand in 3/16" circular orbits against the work.



Detachable sanding pad simplifies re-loading of abrasives. Several pads can be loaded at one time, kept near work, and be easily and quickly interchanged.

The Sterling 1000 sands, laps and polishes with ease. Vibrationless—light in weight, only one hand is needed to guide it over the work. Its balanced and counter-balanced design, 25% excess power capacity air cooled motor, and sealed cartridge type transmission unit assure trouble-free operation and long life.

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★

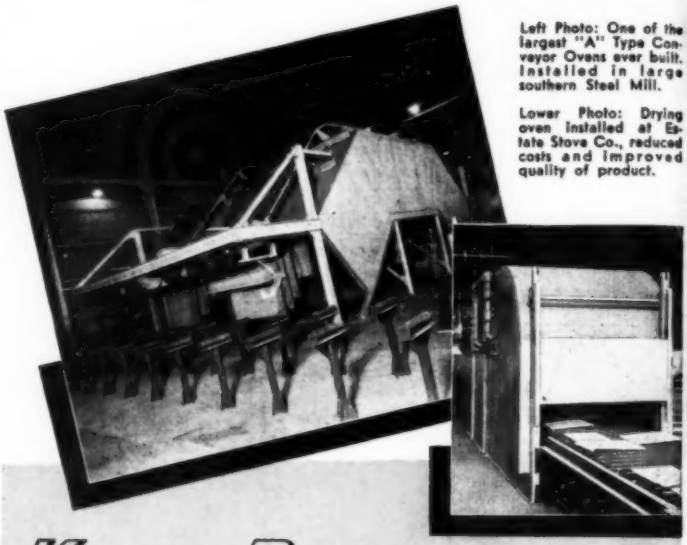
YUGOSLAVIA

In October, 1918, the Yugoslav army smashed the invaders resistance on the Salonika front and, with an irresistible drive toward the north, reoccupied Belgrade on Nov. 3, 1918. Eight days later came the armistice. Today, as in '18, Yugoslavia is again our ally and even though enemy troops occupy the country, thousands of loyal and patriotic citizens (both men and women) are still fighting the invaders. Organized guerrilla warfare is being waged on a large scale and expert saboteurs plague the Nazis at every turn. So much history is being repeated in this war that perhaps Yugoslavia may once again spark the downfall of our present enemy.

ADVANCE PAINT COMPANY

Manufacturers of Wood & Metal Finishing Materials

INDIANAPOLIS, INDIANA



Left Photo: One of the largest "A" Type Conveyor Ovens ever built. Installed in large southern Steel Mill.

Lower Photo: Drying oven installed at Estate Stove Co., reduced costs and improved quality of product.

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